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REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Geometry Regents Exam Questions
from Spring 2008 to January 2016 Sorted by PI: Topic

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Geometry Regents Exam Questions by Performance Indicator: Topic

LINEAR EQUATIONS

G.G.62: PARALLEL AND PERPENDICULAR LINES

1 What is the slope of a line perpendicular to the line whose equation is $5x + 3y = 8$?

1 $\frac{5}{3}$
2 $\frac{3}{5}$
3 $-\frac{3}{5}$
4 $-\frac{5}{3}$

2 What is the slope of a line perpendicular to the line whose equation is $y = -\frac{2}{3}x - 5$?

1 $-\frac{3}{2}$
2 $-\frac{2}{3}$
3 $\frac{2}{3}$
4 $\frac{3}{2}$

3 What is the slope of a line that is perpendicular to the line whose equation is $3x + 4y = 12$?

1 $\frac{3}{4}$
2 $-\frac{3}{4}$
3 $\frac{4}{3}$
4 $-\frac{4}{3}$

4 What is the slope of a line perpendicular to the line whose equation is $y = 3x + 4$?

1 $\frac{1}{3}$
2 $-\frac{1}{3}$
3 3
4 –3

5 What is the slope of a line perpendicular to the line whose equation is $2y = -6x + 8$?

1 –3
2 $\frac{1}{6}$
3 $\frac{1}{3}$
4 –6

6 Find the slope of a line perpendicular to the line whose equation is $2y - 6x = 4$.

7 What is the slope of a line that is perpendicular to the line whose equation is $3x + 5y = 4$?

1 $-\frac{3}{5}$
2 $\frac{3}{5}$
3 $-\frac{5}{3}$
4 $\frac{5}{3}$

8 What is the slope of a line that is perpendicular to the line represented by the equation $x + 2y = 3$?

1 –2
2 2
3 $-\frac{1}{2}$
4 $\frac{1}{2}$

9 What is the slope of a line perpendicular to the line whose equation is $20x - 2y = 6$?
1 -10
2 $-\frac{1}{10}$
3 10
4 $\frac{1}{10}$

10 The slope of line ℓ is $-\frac{1}{3}$. What is an equation of a line that is perpendicular to line ℓ?
1 $y + 2 = \frac{1}{3}x$
2 $-2x + 6 = 6y$
3 $9x - 3y = 27$
4 $3x + y = 0$

11 What is the slope of the line perpendicular to the line represented by the equation $2x + 4y = 12$?
1 -2
2 2
3 $-\frac{1}{2}$
4 $\frac{1}{2}$

12 The equation of a line is $3y + 2x = 12$. What is the slope of the line perpendicular to the given line?
1 $\frac{2}{3}$
2 $\frac{3}{2}$
3 $-\frac{2}{3}$
4 $-\frac{3}{2}$

13 What is the slope of a line perpendicular to the line whose equation is $3x - 7y + 14 = 0$?
1 $\frac{3}{7}$
2 $-\frac{7}{3}$
3 3
4 $-\frac{1}{3}$

14 The lines whose equations are $2x + 3y = 4$ and $y = mx + 6$ will be perpendicular when m is
1 $-\frac{3}{2}$
2 $-\frac{2}{3}$
3 $\frac{3}{2}$
4 $\frac{2}{3}$

15 The slope of $\overline{QR}$ is $\frac{x-1}{4}$ and the slope of $\overline{ST}$ is $\frac{8}{3}$. If $\overline{QR} \perp \overline{ST}$, determine and state the value of x.

G.G.63: PARALLEL AND PERPENDICULAR LINES

16 The lines $3y + 1 = 6x + 4$ and $2y + 1 = x - 9$ are
1 parallel
2 perpendicular
3 the same line
4 neither parallel nor perpendicular

17 Which equation represents a line perpendicular to the line whose equation is $2x + 3y = 12$?
1 $6y = -4x + 12$
2 $2y = 3x + 6$
3 $2y = -3x + 6$
4 $3y = -2x + 12$

18 What is the equation of a line that is parallel to the line whose equation is $y = x + 2$?
1 $x + y = 5$
2 $2x + y = -2$
3 $y - x = -1$
4 $y - 2x = 3$

19 Which equation represents a line parallel to the line whose equation is $2y - 5x = 10$?
1 $5y - 2x = 25$
2 $5y + 2x = 10$
3 $4y - 10x = 12$
4 $2y + 10x = 8$

20 Two lines are represented by the equations $-\frac{1}{2}y = 6x + 10$ and $y = mx$. For which value of m will the lines be parallel?
1 -12
2 -3
3 3
4 12

21 The lines represented by the equations $y + \frac{1}{2}x = 4$ and $3x + 6y = 12$ are
1 the same line
2 parallel
3 perpendicular
4 neither parallel nor perpendicular

22 The two lines represented by the equations below are graphed on a coordinate plane.

$$x + 6y = 12$$

$$3(x - 2) = -y - 4$$

Which statement best describes the two lines?
1 The lines are parallel.
2 The lines are the same line.
3 The lines are perpendicular.
4 The lines intersect at an angle other than 90°.

23 The equation of line k is $y = \frac{1}{3}x - 2$. The equation of line m is $-2x + 6y = 18$. Lines k and m are
1 parallel
2 perpendicular
3 the same line
4 neither parallel nor perpendicular

24 The graphs of the lines represented by the equations $y = \frac{1}{3}x + 7$ and $y = -\frac{1}{3}x - 2$ are
1 parallel
2 horizontal
3 perpendicular
4 intersecting, but not perpendicular

25 Determine whether the two lines represented by the equations $y = 2x + 3$ and $2y + x = 6$ are parallel, perpendicular, or neither. Justify your response.

26 Two lines are represented by the equations $x + 2y = 4$ and $4y - 2x = 12$. Determine whether these lines are parallel, perpendicular, or neither. Justify your answer.

27 Which equation represents a line that is parallel to the line whose equation is $3x - 2y = 7$?
1 $y = -\frac{3}{2}x + 5$
2 $y = -\frac{2}{3}x + 4$
3 $y = \frac{3}{2}x - 5$
4 $y = \frac{2}{3}x - 4$

28 Points $A(5,3)$ and $B(7,6)$ lie on $\overleftrightarrow{AB}$. Points $C(6,4)$ and $D(9,0)$ lie on $\overleftrightarrow{CD}$. Which statement is true?

1 $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$
2 $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$
3 $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are the same line.
4 $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect, but are not perpendicular.

29 A student wrote the following equations:

$$3y + 6 = 2x$$

$$2y - 3x = 6$$

The lines represented by these equations are

1 parallel
2 the same line
3 perpendicular
4 intersecting, but *not* perpendicular

30 State whether the lines represented by the equations $y = \frac{1}{2}x - 1$ and $y + 4 = -\frac{1}{2}(x - 2)$ are parallel, perpendicular, or neither. Explain your answer.

31 The equations of lines *k*, *p*, and *m* are given below:

$$k: x + 2y = 6$$

$$p: 6x + 3y = 12$$

$$m: -x + 2y = 10$$

Which statement is true?

1 $p \perp m$
2 $m \perp k$
3 $k \parallel p$
4 $m \parallel k$

32 The lines represented by the equations $4x + 6y = 6$ and $y = \frac{2}{3}x - 1$ are

1 parallel
2 the same line
3 perpendicular
4 intersecting, but *not* perpendicular

33 The equations of lines *k*, *m*, and *n* are given below.

$$k: 3y + 6 = 2x$$

$$m: 3y + 2x + 6 = 0$$

$$n: 2y = 3x + 6$$

Which statement is true?

1 $k \parallel m$
2 $n \parallel m$
3 $m \perp k$
4 $m \perp n$

G.G.64: PARALLEL AND PERPENDICULAR LINES

34 What is an equation of the line that passes through the point $(-2,5)$ and is perpendicular to the line whose equation is $y = \frac{1}{2}x + 5$?

1 $y = 2x + 1$
2 $y = -2x + 1$
3 $y = 2x + 9$
4 $y = -2x - 9$

35 What is an equation of the line that contains the point $(3,-1)$ and is perpendicular to the line whose equation is $y = -3x + 2$?

1 $y = -3x + 8$
2 $y = -3x$
3 $y = \frac{1}{3}x$
4 $y = \frac{1}{3}x - 2$

36 Find an equation of the line passing through the point $(6,5)$ and perpendicular to the line whose equation is $2y+3x=6$.

37 What is an equation of the line that is perpendicular to the line whose equation is $y=\frac{3}{5}x-2$ and that passes through the point $(3,-6)$?

1 $y=\frac{5}{3}x-11$

2 $y=-\frac{5}{3}x+11$

3 $y=-\frac{5}{3}x-1$

4 $y=\frac{5}{3}x+1$

38 What is the equation of the line that passes through the point $(-9,6)$ and is perpendicular to the line $y=3x-5$?

1 $y=3x+21$

2 $y=-\frac{1}{3}x-3$

3 $y=3x+33$

4 $y=-\frac{1}{3}x+3$

39 Which equation represents the line that is perpendicular to $2y=x+2$ and passes through the point $(4,3)$?

1 $y=\frac{1}{2}x-5$

2 $y=\frac{1}{2}x+1$

3 $y=-2x+11$

4 $y=-2x-5$

40 The equation of a line is $y=\frac{2}{3}x+5$. What is an equation of the line that is perpendicular to the given line and that passes through the point $(4,2)$?

1 $y=\frac{2}{3}x-\frac{2}{3}$

2 $y=\frac{3}{2}x-4$

3 $y=-\frac{3}{2}x+7$

4 $y=-\frac{3}{2}x+8$

41 What is an equation of the line that passes through $(-9,12)$ and is perpendicular to the line whose equation is $y=\frac{1}{3}x+6$?

1 $y=\frac{1}{3}x+15$

2 $y=-3x-15$

3 $y=\frac{1}{3}x-13$

4 $y=-3x+27$

42 What is an equation of the line that passes through the point $(2,4)$ and is perpendicular to the line whose equation is $3y=6x+3$?

1 $y=-\frac{1}{2}x+5$

2 $y=-\frac{1}{2}x+4$

3 $y=2x-6$

4 $y=2x$

43 Write an equation of the line that is perpendicular to the line whose equation is $2y=3x+12$ and that passes through the origin.

G.G.65: PARALLEL AND PERPENDICULAR LINES

44 What is the equation of a line that passes through the point $(-3,-11)$ and is parallel to the line whose equation is $2x - y = 4$?

1 $y = 2x + 5$
2 $y = 2x - 5$
3 $y = \frac{1}{2}x + \frac{25}{2}$
4 $y = -\frac{1}{2}x - \frac{25}{2}$

45 Which equation represents a line that passes through the point $(-2,6)$ and is parallel to the line whose equation is $3x - 4y = 6$?

1 $3x + 4y = 18$
2 $4x + 3y = 10$
3 $-3x + 4y = 30$
4 $-4x + 3y = 26$

46 Find an equation of the line passing through the point $(5,4)$ and parallel to the line whose equation is $2x + y = 3$.

47 Write an equation of the line that passes through the point $(6,-5)$ and is parallel to the line whose equation is $2x - 3y = 11$.

48 What is an equation of the line that passes through the point $(7,3)$ and is parallel to the line $4x + 2y = 10$?

1 $y = \frac{1}{2}x - \frac{1}{2}$
2 $y = -\frac{1}{2}x + \frac{13}{2}$
3 $y = 2x - 11$
4 $y = -2x + 17$

49 What is an equation of the line that passes through the point $(-2,3)$ and is parallel to the line whose equation is $y = \frac{3}{2}x - 4$?

1 $y = \frac{-2}{3}x$
2 $y = \frac{-2}{3}x + \frac{5}{3}$
3 $y = \frac{3}{2}x$
4 $y = \frac{3}{2}x + 6$

50 Which line is parallel to the line whose equation is $4x + 3y = 7$ and also passes through the point $(-5,2)$?

1 $4x + 3y = -26$
2 $4x + 3y = -14$
3 $3x + 4y = -7$
4 $3x + 4y = 14$

51 Which equation represents the line parallel to the line whose equation is $4x + 2y = 14$ and passing through the point $(2,2)$?

1 $y = -2x$
2 $y = -2x + 6$
3 $y = \frac{1}{2}x$
4 $y = \frac{1}{2}x + 1$

52 What is the equation of a line passing through $(2,-1)$ and parallel to the line represented by the equation $y = 2x + 1$?

1 $y = -\frac{1}{2}x$
2 $y = -\frac{1}{2}x + 1$
3 $y = 2x - 5$
4 $y = 2x - 1$

53 An equation of the line that passes through $(2,-1)$ and is parallel to the line $2y+3x=8$ is

1 $y=\frac{3}{2}x-4$

2 $y=\frac{3}{2}x+4$

3 $y=-\frac{3}{2}x-2$

4 $y=-\frac{3}{2}x+2$

54 Which equation represents a line that is parallel to the line whose equation is $y=\frac{3}{2}x-3$ and passes through the point $(1,2)$?

1 $y=\frac{3}{2}x+\frac{1}{2}$

2 $y=\frac{2}{3}x+\frac{4}{3}$

3 $y=\frac{3}{2}x-2$

4 $y=-\frac{2}{3}x+\frac{8}{3}$

55 What is the equation of a line passing through the point $(6,1)$ and parallel to the line whose equation is $3x=2y+4$?

1 $y=-\frac{2}{3}x+5$

2 $y=-\frac{2}{3}x-3$

3 $y=\frac{3}{2}x-8$

4 $y=\frac{3}{2}x-5$

56 Line ℓ passes through the point $(5,3)$ and is parallel to line k whose equation is $5x+y=6$. An equation of line ℓ is

1 $y=\frac{1}{5}x+2$

2 $y=-5x+28$

3 $y=\frac{1}{5}x-2$

4 $y=-5x-28$

57 What is the equation of a line passing through the point $(4,-1)$ and parallel to the line whose equation is $2y-x=8$?

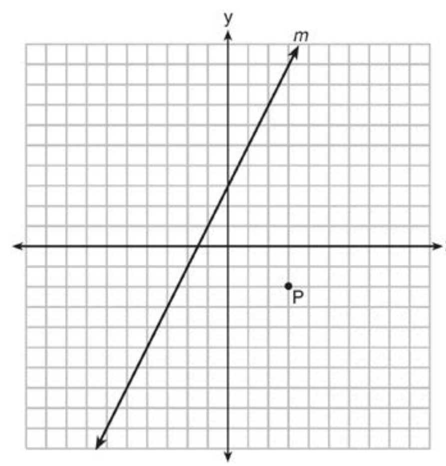
1 $y=\frac{1}{2}x-3$

2 $y=\frac{1}{2}x-1$

3 $y=-2x+7$

4 $y=-2x+2$

58 Line m and point P are shown in the graph below.



Which equation represents the line passing through P and parallel to line m?

1 $y-3=2(x+2)$

2 $y+2=2(x-3)$

3 $y-3=-\frac{1}{2}(x+2)$

4 $y+2=-\frac{1}{2}(x-3)$

59 Write an equation of a line that is parallel to the line whose equation is $3y = x + 6$ and that passes through the point $(-3, 4)$.

60 What is an equation of the line that passes through the point $(4, 5)$ and is parallel to the line whose equation is $y = \frac{2}{3}x - 4$?

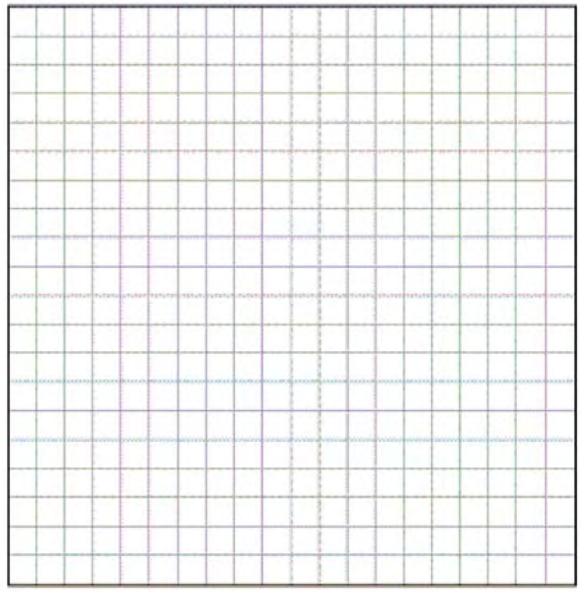
1 $2y + 3x = 11$
2 $2y + 3x = 22$
3 $3y - 2x = 2$
4 $3y - 2x = 7$

61 What is an equation of the line that passes through the point $(-2, 1)$ and is parallel to the line whose equation is $4x - 2y = 8$?

1 $y = \frac{1}{2}x + 2$
2 $y = \frac{1}{2}x - 2$
3 $y = 2x + 5$
4 $y = 2x - 5$

G.G.68: PERPENDICULAR BISECTOR

62 Write an equation of the perpendicular bisector of the line segment whose endpoints are $(-1, 1)$ and $(7, -5)$. [The use of the grid below is optional]



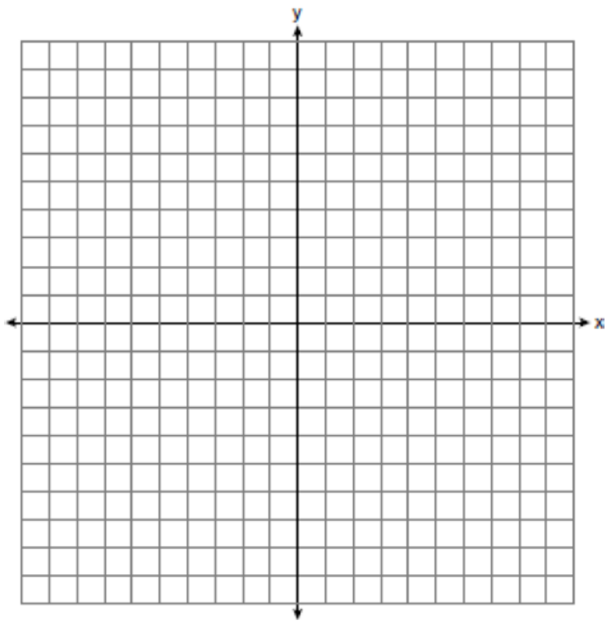
63 Which equation represents the perpendicular bisector of $\overline{AB}$ whose endpoints are $A(8, 2)$ and $B(0, 6)$?

1 $y = 2x - 4$
2 $y = -\frac{1}{2}x + 2$
3 $y = -\frac{1}{2}x + 6$
4 $y = 2x - 12$

64 The coordinates of the endpoints of $\overline{AB}$ are $A(0, 0)$ and $B(0, 6)$. The equation of the perpendicular bisector of $\overline{AB}$ is

1 $x = 0$
2 $x = 3$
3 $y = 0$
4 $y = 3$

65 Write an equation of the line that is the perpendicular bisector of the line segment having endpoints $(3,-1)$ and $(3,5)$. [The use of the grid below is optional]



66 Triangle ABC has vertices $A(0,0)$, $B(6,8)$, and $C(8,4)$. Which equation represents the perpendicular bisector of $\overline{BC}$?

1 $y = 2x - 6$
2 $y = -2x + 4$
3 $y = \frac{1}{2}x + \frac{5}{2}$
4 $y = -\frac{1}{2}x + \frac{19}{2}$

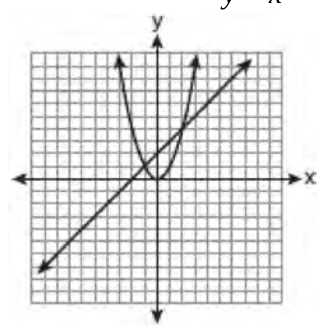
67 If $\overline{AB}$ is defined by the endpoints $A(4,2)$ and $B(8,6)$, write an equation of the line that is the perpendicular bisector of $\overline{AB}$.

SYSTEMS

G.G.70: QUADRATIC-LINEAR SYSTEMS

68 Which graph could be used to find the solution to the following system of equations?

$$y = -x + 2$$
$$y = x^2$$

1


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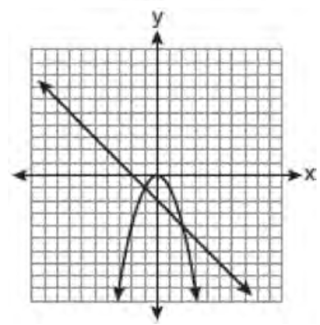

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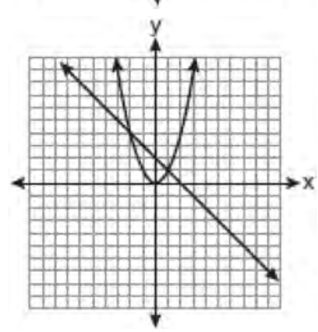

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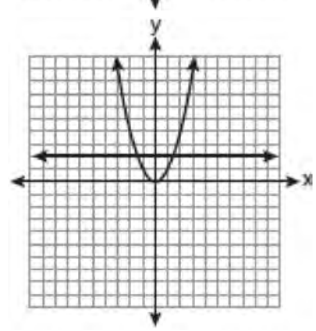


69 Given the system of equations: $y = x^2 - 4x$

$$x = 4$$

The number of points of intersection is
1 1
2 2
3 3
4 0

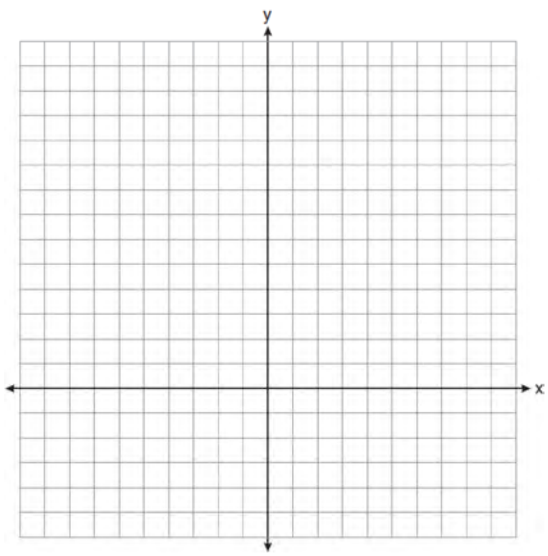
70 Given the equations: $y = x^2 - 6x + 10$

$$y + x = 4$$

What is the solution to the given system of equations?
1 $(2,3)$
2 $(3,2)$
3 $(2,2)$ and $(1,3)$
4 $(2,2)$ and $(3,1)$

71 On the set of axes below, solve the following system of equations graphically for all values of x and y.

$$y = (x-2)^2 + 4$$
$$4x + 2y = 14$$



72 Given: $y = \frac{1}{4}x - 3$

$$y = x^2 + 8x + 12$$

In which quadrant will the graphs of the given equations intersect?
1 I
2 II
3 III
4 IV

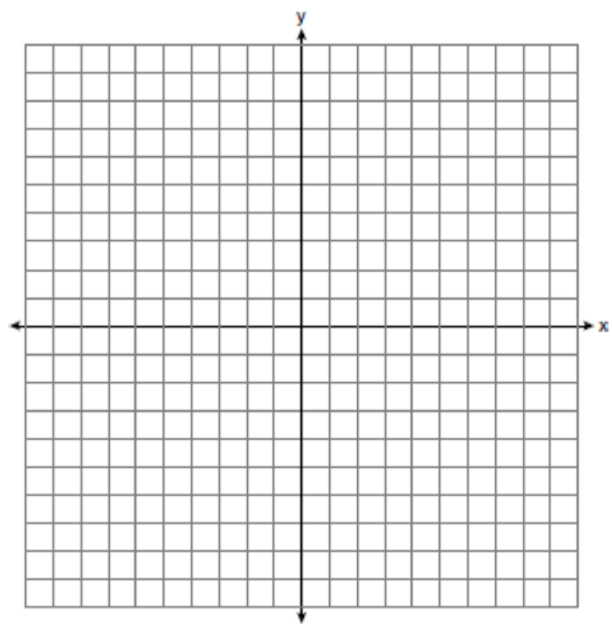
73 What is the solution of the following system of equations?

$$y = (x+3)^2 - 4$$
$$y = 2x + 5$$

1 $(0,-4)$
2 $(-4,0)$
3 $(-4,-3)$ and $(0,5)$
4 $(-3,-4)$ and $(5,0)$

74 Solve the following system of equations graphically.

$$2x^2 - 4x = y + 1$$
$$x + y = 1$$



75 When solved graphically, what is the solution to the following system of equations?

$$y = x^2 - 4x + 6$$

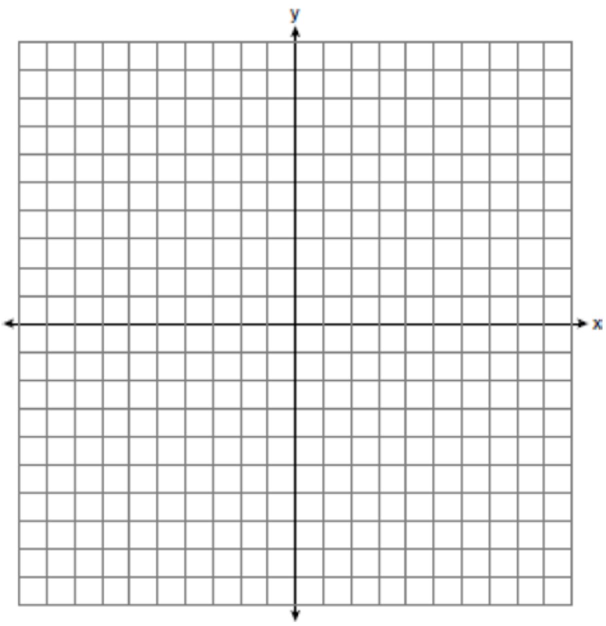
$$y = x + 2$$

1 $(1,4)$
2 $(4,6)$
3 $(1,3)$ and $(4,6)$
4 $(3,1)$ and $(6,4)$

76 On the set of axes below, solve the system of equations graphically and state the coordinates of all points in the solution.

$$y = (x-2)^2 - 3$$

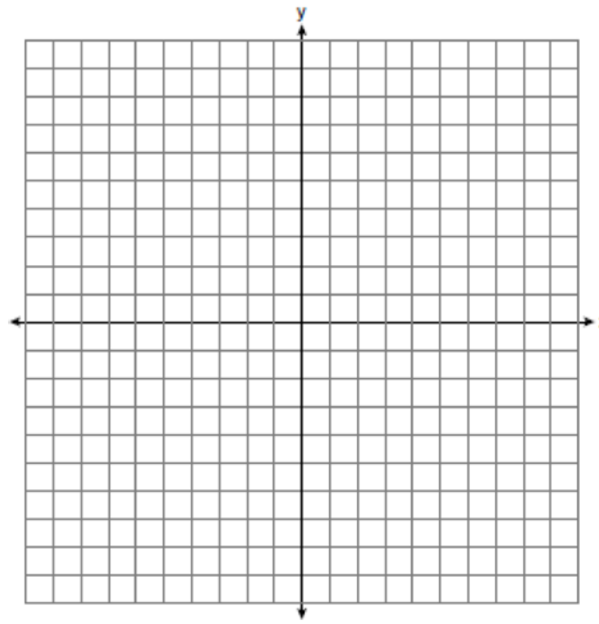
$$2y + 16 = 4x$$



77 On the set of axes below, solve the following system of equations graphically and state the coordinates of *all* points in the solution.

$$(x+3)^2 + (y-2)^2 = 25$$

$$2y + 4 = -x$$

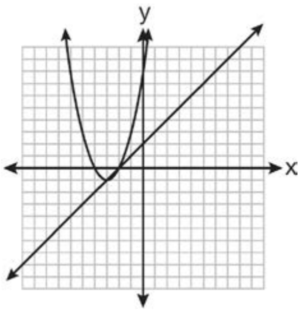


78 The equations $x^2 + y^2 = 25$ and $y = 5$ are graphed on a set of axes. What is the solution of this system?

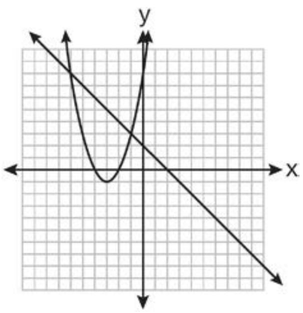
1 $(0,0)$
2 $(5,0)$
3 $(0,5)$
4 $(5,5)$

79 Which graph could be used to find the solution to the following system of equations?

$$y = (x+3)^2 - 1$$
$$x + y = 2$$



1



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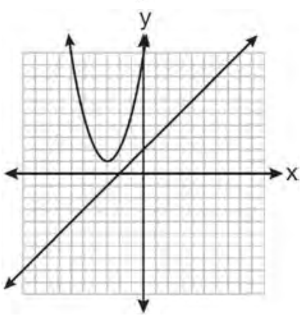

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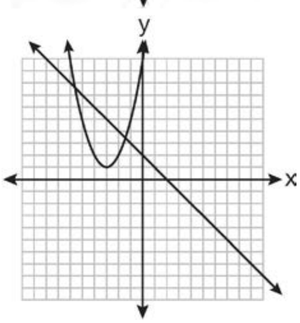


4

80 When the system of equations $y + 2 = (x-4)^2$ and $2x + y - 6 = 0$ is solved graphically, the solution is
1 $(-4,-2)$ and $(-2,2)$
2 $(4,-2)$ and $(2,2)$
3 $(-4,2)$ and $(-6,6)$
4 $(4,2)$ and $(6,6)$

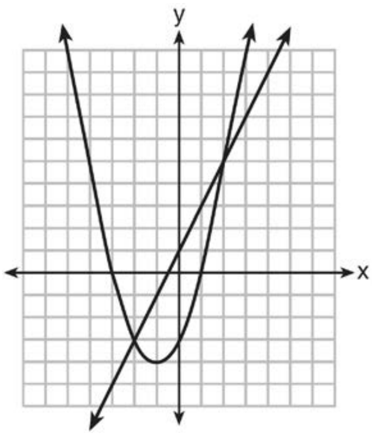
81 The solution of the system of equations $y = x^2 - 2$ and $y = x$ is
1 $(1,1)$ and $(-2,-2)$
2 $(2,2)$ and $(-1,-1)$
3 $(1,1)$ and $(2,2)$
4 $(-2,-2)$ and $(-1,-1)$

82 When the system of equations $y + 2x = x^2$ and $y = x$ is graphed on a set of axes, what is the total number of points of intersection?
1 1
2 2
3 3
4 0

83 What is the solution of the system of equations $y - x = 5$ and $y = x^2 + 5$?
1 $(0,5)$ and $(1,6)$
2 $(0,5)$ and $(-1,6)$
3 $(2,9)$ and $(-1,4)$
4 $(-2,9)$ and $(-1,4)$

84 What is the solution of the system of equations graphed below?

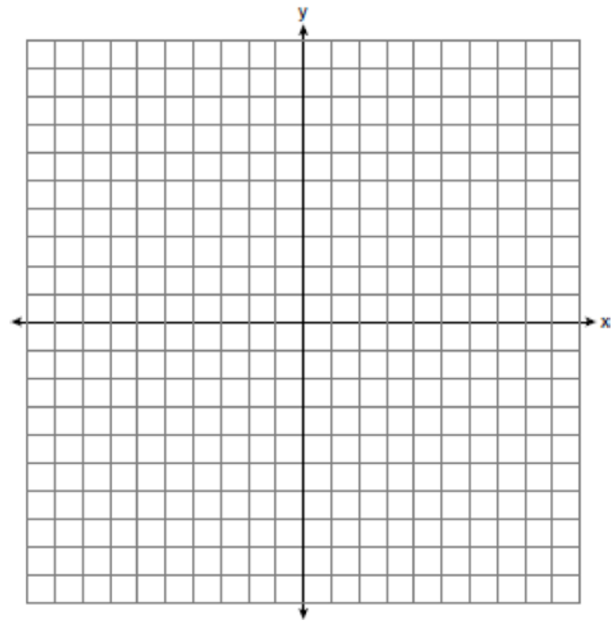
$$y = 2x + 1$$
$$y = x^2 + 2x - 3$$



1 $(0,-3)$
2 $(-1,-4)$
3 $(-3,0)$ and $(1,0)$
4 $(-2,-3)$ and $(2,5)$

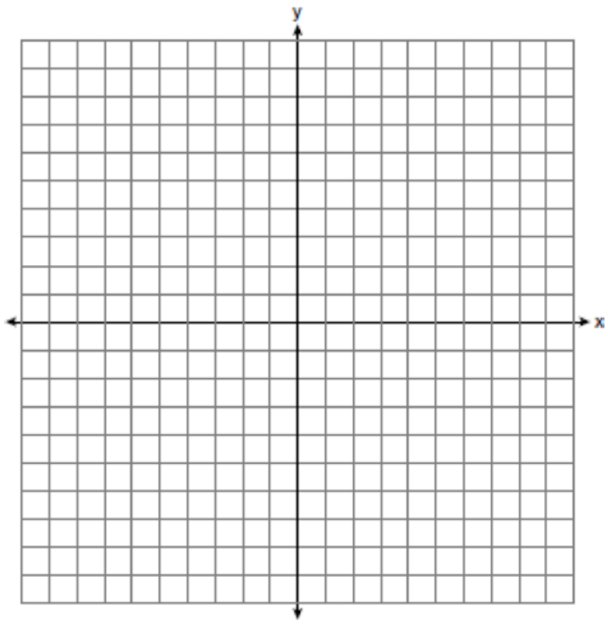
85 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$
$$x + y = 5$$



86 On the set of axes below, solve the following system of equations graphically and state the coordinates of all points in the solution.

$$y = x^2 + 4x + 2$$
$$y - 2x = 5$$

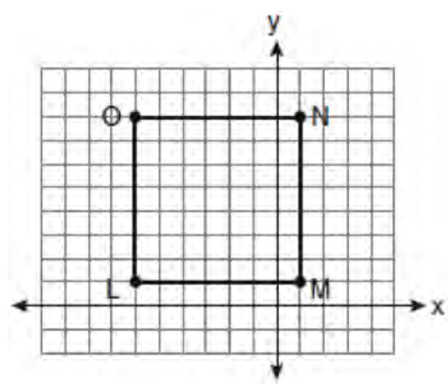


87 The equations $y = 2x + 3$ and $y = -x^2 - x + 1$ are graphed on the same set of axes. The coordinates of a point in the solution of this system of equations are
1 $(0,1)$
2 $(1,5)$
3 $(-1,-2)$
4 $(-2,-1)$

TOOLS OF GEOMETRY
G.G.66: MIDPOINT

88 Line segment AB has endpoints $A(2,-3)$ and $B(-4,6)$. What are the coordinates of the midpoint of $\overline{AB}$?
1 $(-2,3)$
2 $\left(-1,1\frac{1}{2}\right)$
3 $(-1,3)$
4 $\left(3,4\frac{1}{2}\right)$

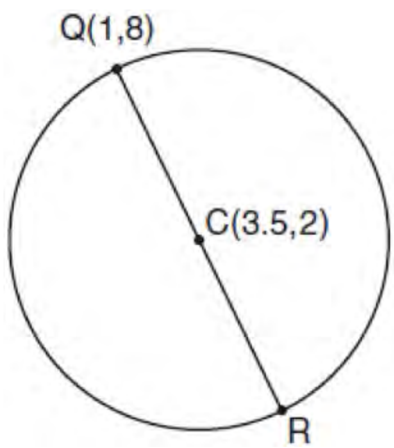
89 Square $LMNO$ is shown in the diagram below.



What are the coordinates of the midpoint of diagonal $\overline{LN}$?
1 $\left(4\frac{1}{2},-2\frac{1}{2}\right)$
2 $\left(-3\frac{1}{2},3\frac{1}{2}\right)$
3 $\left(-2\frac{1}{2},3\frac{1}{2}\right)$
4 $\left(-2\frac{1}{2},4\frac{1}{2}\right)$

90 The endpoints of $\overline{CD}$ are $C(-2,-4)$ and $D(6,2)$. What are the coordinates of the midpoint of $\overline{CD}$?
1 $(2,3)$
2 $(2,-1)$
3 $(4,-2)$
4 $(4,3)$

91 In the diagram below of circle C, $\overline{QR}$ is a diameter, and $Q(1,8)$ and $C(3.5,2)$ are points on a coordinate plane. Find and state the coordinates of point R.



92 If a line segment has endpoints $A(3x+5,3y)$ and $B(x-1,-y)$, what are the coordinates of the midpoint of $\overline{AB}$?
1 $(x+3,2y)$
2 $(2x+2,y)$
3 $(2x+3,y)$
4 $(4x+4,2y)$

93 A line segment has endpoints $A(7,-1)$ and $B(-3,3)$. What are the coordinates of the midpoint of $\overline{AB}$?
1 $(1,2)$
2 $(2,1)$
3 $(-5,2)$
4 $(5,-2)$

94 In circle O, diameter $\overline{RS}$ has endpoints $R(3a,2b-1)$ and $S(a-6,4b+5)$. Find the coordinates of point O, in terms of a and b. Express your answer in simplest form.

95 Segment AB is the diameter of circle M. The coordinates of A are $(-4,3)$. The coordinates of M are $(1,5)$. What are the coordinates of B?
1 $(6,7)$
2 $(5,8)$
3 $(-3,8)$
4 $(-5,2)$

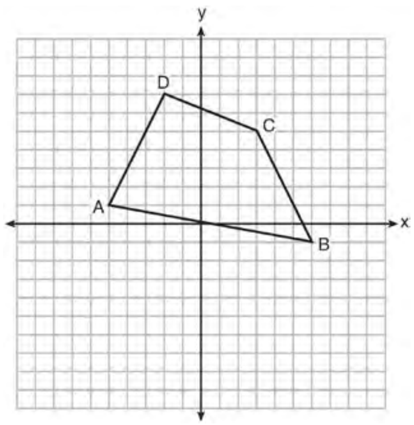
96 Point M is the midpoint of $\overline{AB}$. If the coordinates of A are $(-3,6)$ and the coordinates of M are $(-5,2)$, what are the coordinates of B?
1 $(1,2)$
2 $(7,10)$
3 $(-4,4)$
4 $(-7,-2)$

97 Line segment AB is a diameter of circle O whose center has coordinates $(6,8)$. What are the coordinates of point B if the coordinates of point A are $(4,2)$?
1 $(1,3)$
2 $(5,5)$
3 $(8,14)$
4 $(10,10)$

98 What are the coordinates of the center of a circle if the endpoints of its diameter are $A(8,-4)$ and $B(-3,2)$?
1 $(2.5,1)$
2 $(2.5,-1)$
3 $(5.5,-3)$
4 $(5.5,3)$

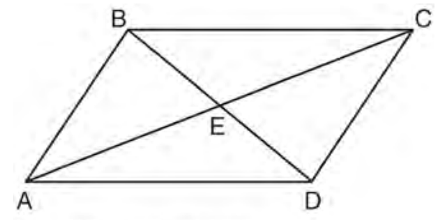
99 The midpoint of $\overline{AB}$ is $M(4,2)$. If the coordinates of A are $(6,-4)$, what are the coordinates of B?
1 $(1,-3)$
2 $(2,8)$
3 $(5,-1)$
4 $(14,0)$

100 In the diagram below, quadrilateral $ABCD$ has vertices $A(-5,1)$, $B(6,-1)$, $C(3,5)$, and $D(-2,7)$.



What are the coordinates of the midpoint of diagonal $\overline{AC}$?
1 $(-1,3)$
2 $(1,3)$
3 $(1,4)$
4 $(2,3)$

101 In the diagram below, parallelogram $ABCD$ has vertices $A(1,3)$, $B(5,7)$, $C(10,7)$, and $D(6,3)$. Diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



(Not drawn to scale)

What are the coordinates of point E?
1 $(0.5,2)$
2 $(4.5,2)$
3 $(5.5,5)$
4 $(7.5,7)$

102 What are the coordinates of the midpoint of the line segment with endpoints $(2,-5)$ and $(8,3)$?
1 $(3,-4)$
2 $(3,-1)$
3 $(5,-4)$
4 $(5,-1)$

103 Point M is the midpoint of $\overline{AB}$. If the coordinates of M are $(2,8)$ and the coordinates of A are $(10,12)$, what are the coordinates of B?
1 $(6,10)$
2 $(-6,4)$
3 $(-8,-4)$
4 $(18,16)$

G.G.67: DISTANCE

104 The endpoints of $\overline{PQ}$ are $P(-3,1)$ and $Q(4,25)$. Find the length of $\overline{PQ}$.

105 If the endpoints of $\overline{AB}$ are $A(-4,5)$ and $B(2,-5)$, what is the length of $\overline{AB}$?
1 $2\sqrt{34}$
2 2
3 $\sqrt{61}$
4 8

106 What is the distance between the points $(-3,2)$ and $(1,0)$?
1 $2\sqrt{2}$
2 $2\sqrt{3}$
3 $5\sqrt{2}$
4 $2\sqrt{5}$

107 What is the length, to the *nearest tenth*, of the line segment joining the points $(-4,2)$ and $(146,52)$?
1 141.4
2 150.5
3 151.9
4 158.1

108 What is the length of the line segment with endpoints $(-6,4)$ and $(2,-5)$?
1 $\sqrt{13}$
2 $\sqrt{17}$
3 $\sqrt{72}$
4 $\sqrt{145}$

109 In circle O, a diameter has endpoints $(-5,4)$ and $(3,-6)$. What is the length of the diameter?
1 $\sqrt{2}$
2 $2\sqrt{2}$
3 $\sqrt{10}$
4 $2\sqrt{41}$

110 What is the length of the line segment whose endpoints are $A(-1,9)$ and $B(7,4)$?
1 $\sqrt{61}$
2 $\sqrt{89}$
3 $\sqrt{205}$
4 $\sqrt{233}$

111 What is the length of the line segment whose endpoints are $(1,-4)$ and $(9,2)$?
1 5
2 $2\sqrt{17}$
3 10
4 $2\sqrt{26}$

112 A line segment has endpoints $(4,7)$ and $(1,11)$. What is the length of the segment?
1 5
2 7
3 16
4 25

113 What is the length of $\overline{AB}$ with endpoints $A(-1,0)$ and $B(4,-3)$?
1 $\sqrt{6}$
2 $\sqrt{18}$
3 $\sqrt{34}$
4 $\sqrt{50}$

114 Determine and state the length of a line segment whose endpoints are $(6,4)$ and $(-9,-4)$.

115 The coordinates of the endpoints of $\overline{FG}$ are $(-4,3)$ and $(2,5)$. Find the length of $\overline{FG}$ in simplest radical form.

116 Find, in simplest radical form, the length of the line segment with endpoints whose coordinates are $(-1,4)$ and $(3,-2)$.

117 The endpoints of $\overline{AB}$ are $A(3,-4)$ and $B(7,2)$. Determine and state the length of $\overline{AB}$ in simplest radical form.

118 What is the length of $\overline{RS}$ with $R(-2,3)$ and $S(4,5)$?
1 $2\sqrt{2}$
2 40
3 $2\sqrt{10}$
4 $2\sqrt{17}$

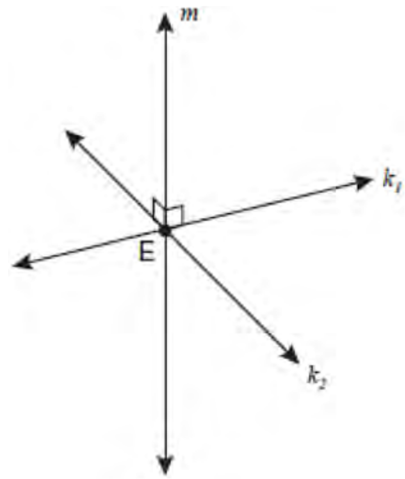
119 Line segment AB has endpoint A located at the origin. Line segment AB is longest when the coordinates of B are
1 $(3,7)$
2 $(2,-8)$
3 $(-6,4)$
4 $(-5,-5)$

120 What is the length of a line segment whose endpoints have coordinates $(5,3)$ and $(1,6)$?
1 5
2 25
3 $\sqrt{17}$
4 $\sqrt{29}$

121 The coordinates of the endpoints of $\overline{CD}$ are $C(3,8)$ and $D(6,-1)$. Find the length of $\overline{CD}$ in simplest radical form.

G.G.1: PLANES

122 Lines k_1 and k_2 intersect at point E. Line m is perpendicular to lines k_1 and k_2 at point E.



Which statement is always true?
1 Lines k_1 and k_2 are perpendicular.
2 Line m is parallel to the plane determined by lines k_1 and k_2.
3 Line m is perpendicular to the plane determined by lines k_1 and k_2.
4 Line m is coplanar with lines k_1 and k_2.

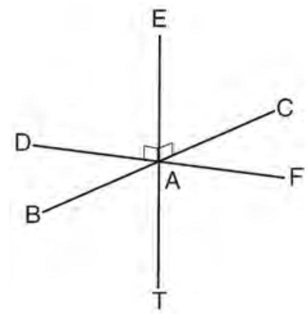
123 Lines j and k intersect at point P. Line m is drawn so that it is perpendicular to lines j and k at point P. Which statement is correct?
1 Lines j and k are in perpendicular planes.
2 Line m is in the same plane as lines j and k.
3 Line m is parallel to the plane containing lines j and k.
4 Line m is perpendicular to the plane containing lines j and k.

124 In plane $\mathcal{P}$, lines *m* and *n* intersect at point *A*. If line *k* is perpendicular to line *m* and line *n* at point *A*, then line *k* is
1 contained in plane $\mathcal{P}$
2 parallel to plane $\mathcal{P}$
3 perpendicular to plane $\mathcal{P}$
4 skew to plane $\mathcal{P}$

125 Lines *m* and *n* intersect at point *A*. Line *k* is perpendicular to both lines *m* and *n* at point *A*. Which statement *must* be true?
1 Lines *m*, *n*, and *k* are in the same plane.
2 Lines *m* and *n* are in two different planes.
3 Lines *m* and *n* are perpendicular to each other.
4 Line *k* is perpendicular to the plane containing lines *m* and *n*.

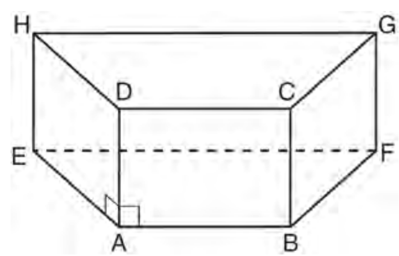
126 Lines *a* and *b* intersect at point *P*. Line *c* passes through *P* and is perpendicular to the plane containing lines *a* and *b*. Which statement must be true?
1 Lines *a*, *b*, and *c* are coplanar.
2 Line *a* is perpendicular to line *b*.
3 Line *c* is perpendicular to both line *a* and line *b*.
4 Line *c* is perpendicular to line *a* or line *b*, but not both.

127 As shown in the diagram below, $\overline{FD}$ and $\overline{CB}$ intersect at point *A* and $\overline{ET}$ is perpendicular to both $\overline{FD}$ and $\overline{CB}$ at *A*.



Which statement is *not* true?
1 $\overline{ET}$ is perpendicular to plane *BAD*.
2 $\overline{ET}$ is perpendicular to plane *FAB*.
3 $\overline{ET}$ is perpendicular to plane *CAD*.
4 $\overline{ET}$ is perpendicular to plane *BAT*.

128 In the prism shown below, $\overline{AD} \perp \overline{AE}$ and $\overline{AD} \perp \overline{AB}$.



Which plane is perpendicular to $\overline{AD}$?
1 HEA
2 BAD
3 EAB
4 EHG

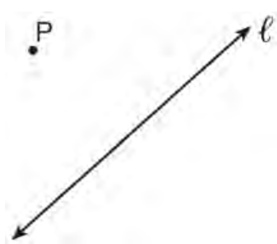
G.G.2: PLANES

129 Point P is on line m. What is the total number of planes that are perpendicular to line m and pass through point P?
1 1
2 2
3 0
4 infinite

130 Point P lies on line m. Point P is also included in distinct planes $\mathcal{Q}$, $\mathcal{R}$, $\mathcal{S}$, and $\mathcal{T}$. At most, how many of these planes could be perpendicular to line m?
1 1
2 2
3 3
4 4

131 Point A is on line m. How many distinct planes will be perpendicular to line m and pass through point A?
1 one
2 two
3 zero
4 infinite

132 In the diagram below, point P is not on line ℓ.



How many distinct planes that contain point P are also perpendicular to line ℓ?
1 1
2 2
3 0
4 an infinite amount

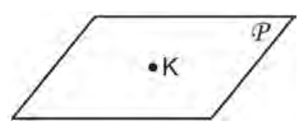
G.G.3: PLANES

133 Through a given point, P, on a plane, how many lines can be drawn that are perpendicular to that plane?
1 1
2 2
3 more than 2
4 none

134 Point A is not contained in plane $\mathcal{B}$. How many lines can be drawn through point A that will be perpendicular to plane $\mathcal{B}$?
1 one
2 two
3 zero
4 infinite

135 Point A lies in plane $\mathcal{B}$. How many lines can be drawn perpendicular to plane $\mathcal{B}$ through point A?
1 one
2 two
3 zero
4 infinite

136 In the diagram below, point K is in plane $\mathcal{P}$.



How many lines can be drawn through K, perpendicular to plane $\mathcal{P}$?
1 1
2 2
3 0
4 an infinite number

137 Point W is located in plane $\mathcal{R}$. How many distinct lines passing through point W are perpendicular to plane $\mathcal{R}$?
1 one
2 two
3 zero
4 infinite

138 Point A lies on plane $\mathcal{P}$. How many distinct lines passing through point A are perpendicular to plane $\mathcal{P}$?
1 1
2 2
3 0
4 infinite

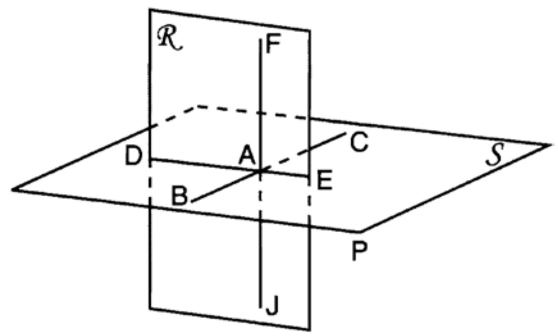
G.G.4: PLANES

139 If two different lines are perpendicular to the same plane, they are
1 collinear
2 coplanar
3 congruent
4 consecutive

G.G.5: PLANES

140 If $\overleftrightarrow{AB}$ is contained in plane $\mathcal{P}$, and $\overleftrightarrow{AB}$ is perpendicular to plane $\mathcal{R}$, which statement is true?
1 $\overleftrightarrow{AB}$ is parallel to plane $\mathcal{R}$.
2 Plane $\mathcal{P}$ is parallel to plane $\mathcal{R}$.
3 $\overleftrightarrow{AB}$ is perpendicular to plane $\mathcal{P}$.
4 Plane $\mathcal{P}$ is perpendicular to plane $\mathcal{R}$.

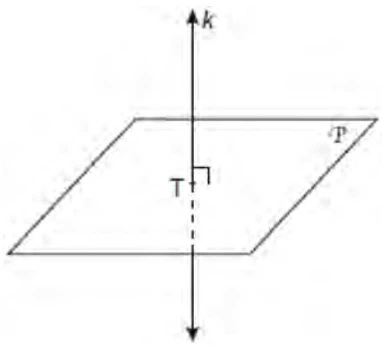
141 As shown in the diagram below, $\overline{FJ}$ is contained in plane $\mathcal{R}$, $\overline{BC}$ and $\overline{DE}$ are contained in plane $\mathcal{S}$, and $\overline{FJ}$, $\overline{BC}$, and $\overline{DE}$ intersect at A.



Which fact is sufficient to show that planes $\mathcal{R}$ and $\mathcal{S}$ are perpendicular?
1 $\overline{FA} \perp \overline{DE}$
2 $\overline{AD} \perp \overline{AF}$
3 $\overline{BC} \perp \overline{FJ}$
4 $\overline{DE} \perp \overline{BC}$

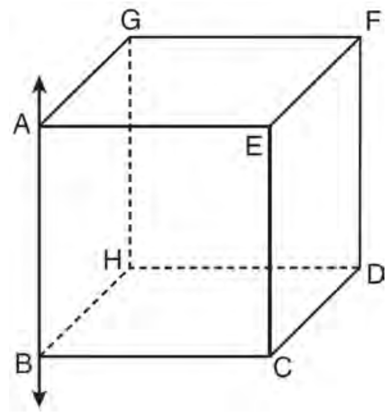
G.G.7: PLANES

142 In the diagram below, line k is perpendicular to plane $\mathcal{P}$ at point T.



Which statement is true?
1 Any point in plane $\mathcal{P}$ also will be on line k.
2 Only one line in plane $\mathcal{P}$ will intersect line k.
3 All planes that intersect plane $\mathcal{P}$ will pass through T.
4 Any plane containing line k is perpendicular to plane $\mathcal{P}$.

143 In the diagram below, $\overleftrightarrow{AB}$ is perpendicular to plane $AEFG$.



Which plane must be perpendicular to plane $AEFG$?
1 $ABCE$
2 $BCDH$
3 $CDFE$
4 $HDFG$

G.G.8: PLANES

144 In three-dimensional space, two planes are parallel and a third plane intersects both of the parallel planes. The intersection of the planes is a
1 plane
2 point
3 pair of parallel lines
4 pair of intersecting lines

145 Plane $\mathcal{A}$ is parallel to plane $\mathcal{B}$. Plane $\mathcal{C}$ intersects plane $\mathcal{A}$ in line m and intersects plane $\mathcal{B}$ in line n. Lines m and n are
1 intersecting
2 parallel
3 perpendicular
4 skew

G.G.9: PLANES

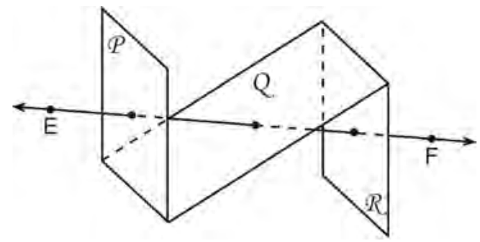
146 Line k is drawn so that it is perpendicular to two distinct planes, P and R. What must be true about planes P and R?
1 Planes P and R are skew.
2 Planes P and R are parallel.
3 Planes P and R are perpendicular.
4 Plane P intersects plane R but is not perpendicular to plane R.

147 A support beam between the floor and ceiling of a house forms a 90º angle with the floor. The builder wants to make sure that the floor and ceiling are parallel. Which angle should the support beam form with the ceiling?
1 45º
2 60º
3 90º
4 180º

148 Plane $\mathcal{R}$ is perpendicular to line k and plane $\mathcal{D}$ is perpendicular to line k. Which statement is correct?
1 Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{D}$.
2 Plane $\mathcal{R}$ is parallel to plane $\mathcal{D}$.
3 Plane $\mathcal{R}$ intersects plane $\mathcal{D}$.
4 Plane $\mathcal{R}$ bisects plane $\mathcal{D}$.

149 If two distinct planes, $\mathcal{A}$ and $\mathcal{B}$, are perpendicular to line c, then which statement is true?
1 Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.
2 Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
3 The intersection of planes $\mathcal{A}$ and $\mathcal{B}$ is a line parallel to line c.
4 The intersection of planes $\mathcal{A}$ and $\mathcal{B}$ is a line perpendicular to line c.

150 As shown in the diagram below, $\overleftrightarrow{EF}$ intersects planes $\mathcal{P}$, $\mathcal{Q}$, and $\mathcal{R}$.



If $\overleftrightarrow{EF}$ is perpendicular to planes $\mathcal{P}$ and $\mathcal{R}$, which statement must be true?
1 Plane $\mathcal{P}$ is perpendicular to plane $\mathcal{Q}$.
2 Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{P}$.
3 Plane $\mathcal{P}$ is parallel to plane $\mathcal{Q}$.
4 Plane $\mathcal{R}$ is parallel to plane $\mathcal{P}$.

151 Plane $\mathcal{A}$ and plane $\mathcal{B}$ are two distinct planes that are both perpendicular to line ℓ. Which statement about planes $\mathcal{A}$ and $\mathcal{B}$ is true?
1 Planes $\mathcal{A}$ and $\mathcal{B}$ have a common edge, which forms a line.
2 Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
3 Planes $\mathcal{A}$ and $\mathcal{B}$ intersect each other at exactly one point.
4 Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.

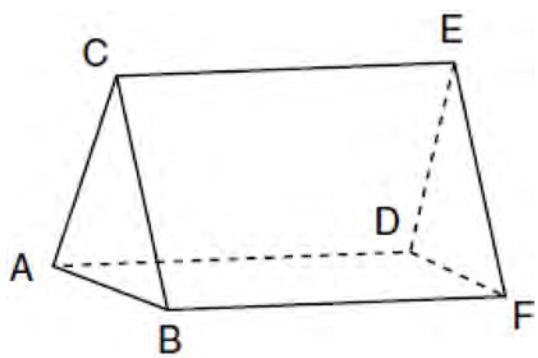
152 If line ℓ is perpendicular to distinct planes $\mathcal{P}$ and $\mathcal{Q}$, then planes $\mathcal{P}$ and $\mathcal{Q}$
1 are parallel
2 contain line ℓ
3 are perpendicular
4 intersect, but are *not* perpendicular

153 If distinct planes $\mathcal{R}$ and $\mathcal{S}$ are both perpendicular to line ℓ, which statement must always be true?
1 Plane $\mathcal{R}$ is parallel to plane $\mathcal{S}$.
2 Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{S}$.
3 Planes $\mathcal{R}$ and $\mathcal{S}$ and line ℓ are all parallel.
4 The intersection of planes $\mathcal{R}$ and $\mathcal{S}$ is perpendicular to line ℓ.

154 Plane $\mathcal{P}$ is parallel to plane $\mathcal{Q}$. If plane $\mathcal{P}$ is perpendicular to line ℓ, then plane $\mathcal{Q}$
1 contains line ℓ
2 is parallel to line ℓ
3 is perpendicular to line ℓ
4 intersects, but is not perpendicular to line ℓ

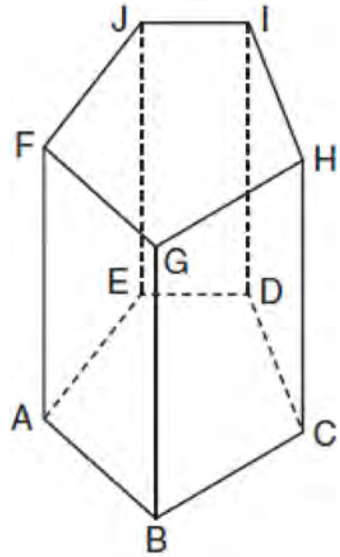
G.G.10: SOLIDS

155 The figure in the diagram below is a triangular prism.



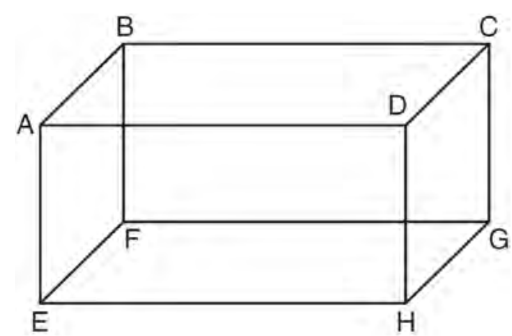
Which statement must be true?
1 $\overline{DE} \cong \overline{AB}$
2 $\overline{AD} \cong \overline{BC}$
3 $\overline{AD} \parallel \overline{CE}$
4 $\overline{DE} \parallel \overline{BC}$

156 The diagram below shows a right pentagonal prism.



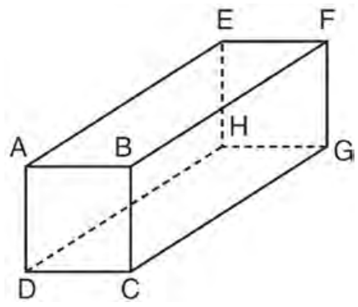
Which statement is always true?
1 $\overline{BC} \parallel \overline{ED}$
2 $\overline{FG} \parallel \overline{CD}$
3 $\overline{FJ} \parallel \overline{IH}$
4 $\overline{GB} \parallel \overline{HC}$

157 The diagram below shows a rectangular prism.



Which pair of edges are segments of lines that are coplanar?
1 $\overline{AB}$ and $\overline{DH}$
2 $\overline{AE}$ and $\overline{DC}$
3 $\overline{BC}$ and $\overline{EH}$
4 $\overline{CG}$ and $\overline{EF}$

158 The diagram below represents a rectangular solid.



Which statement must be true?

1 $\overline{EH}$ and $\overline{BC}$ are coplanar
2 $\overline{FG}$ and $\overline{AB}$ are coplanar
3 $\overline{EH}$ and $\overline{AD}$ are skew
4 $\overline{FG}$ and $\overline{CG}$ are skew

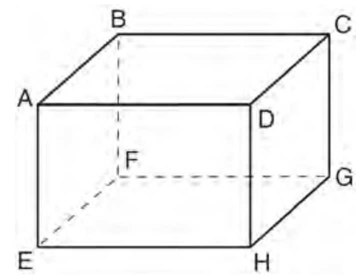
159 The bases of a right prism are triangles in which $\triangle MNP \cong \triangle RST$. If $MP = 9$, $MR = 18$, and $MN = 12$, what is the length of $\overline{NS}$?

1 9
2 12
3 15
4 18

160 The bases of a right triangular prism are $\triangle ABC$ and $\triangle DEF$. Angles A and D are right angles, $AB = 6$, $AC = 8$, and $AD = 12$. What is the length of edge $\overline{BE}$?

1 10
2 12
3 14
4 16

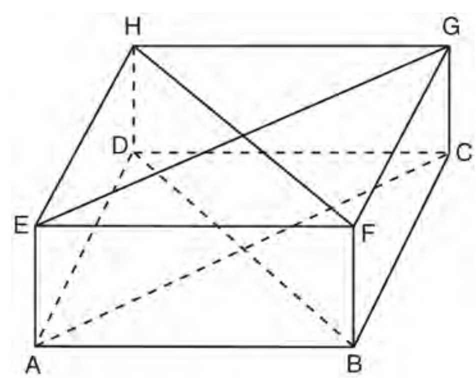
161 A rectangular right prism is shown in the diagram below.



Which pair of edges are *not* coplanar?

1 $\overline{BF}$ and $\overline{CG}$
2 $\overline{BF}$ and $\overline{DH}$
3 $\overline{EF}$ and $\overline{CD}$
4 $\overline{EF}$ and $\overline{BC}$

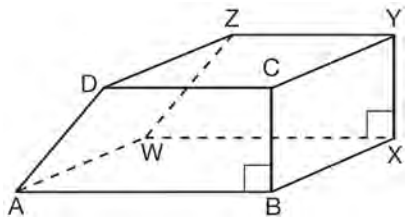
162 A rectangular prism is shown in the diagram below.



Which pair of line segments would always be both congruent and parallel?

1 $\overline{AC}$ and $\overline{FB}$
2 $\overline{FB}$ and $\overline{DB}$
3 $\overline{HF}$ and $\overline{AC}$
4 $\overline{DB}$ and $\overline{HF}$

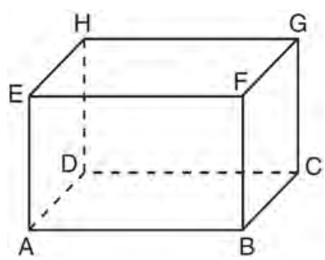
163 The bases of a prism are right trapezoids, as shown in the diagram below.



Which two edges do *not* lie in the same plane?

1 $\overline{BC}$ and $\overline{WZ}$
2 $\overline{AW}$ and $\overline{CY}$
3 $\overline{DC}$ and $\overline{WX}$
4 $\overline{BX}$ and $\overline{AB}$

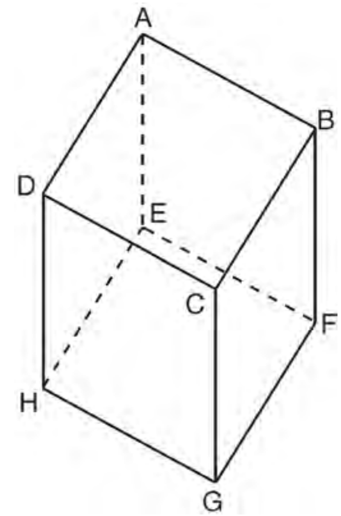
164 A right rectangular prism is shown in the diagram below.



Which line segments are coplanar?

1 $\overline{EF}$ and $\overline{BC}$
2 $\overline{HD}$ and $\overline{FG}$
3 $\overline{GH}$ and $\overline{FB}$
4 $\overline{EA}$ and $\overline{GC}$

165 Which pair of edges is *not* coplanar in the cube shown below?



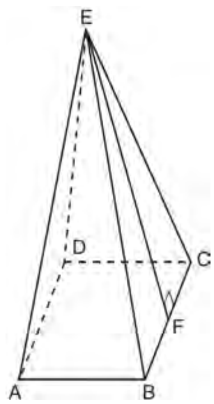
1 $\overline{EH}$ and $\overline{CD}$
2 $\overline{AD}$ and $\overline{FG}$
3 $\overline{DH}$ and $\overline{AE}$
4 $\overline{AB}$ and $\overline{EF}$

G.G.13: SOLIDS

166 The lateral faces of a regular pyramid are composed of

1 squares
2 rectangles
3 congruent right triangles
4 congruent isosceles triangles

167 As shown in the diagram below, a right pyramid has a square base, *ABCD*, and $\overline{EF}$ is the slant height.

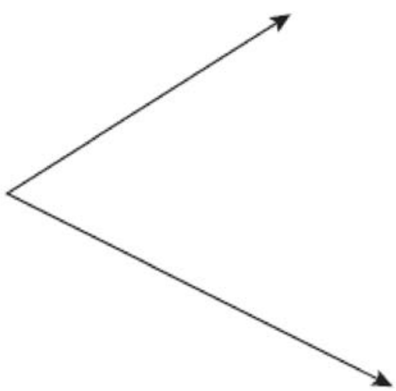


Which statement is *not* true?

1 $\overline{EA} \cong \overline{EC}$
2 $\overline{EB} \cong \overline{EF}$
3 $\triangle AEB \cong \triangle BEC$
4 $\triangle CED$ is isosceles

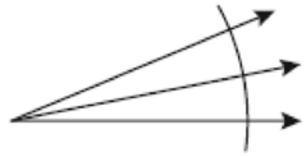
G.G.17: CONSTRUCTIONS

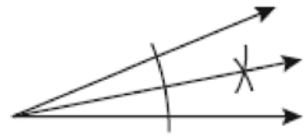
168 Using a compass and straightedge, construct the bisector of the angle shown below. [*Leave all construction marks*.]



169 Which illustration shows the correct construction of an angle bisector?

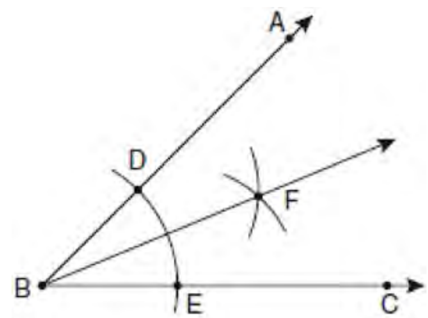
1


2


3


4

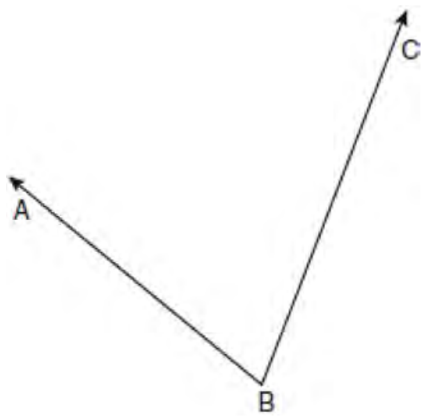

170 The diagram below shows the construction of the bisector of $\angle ABC$.



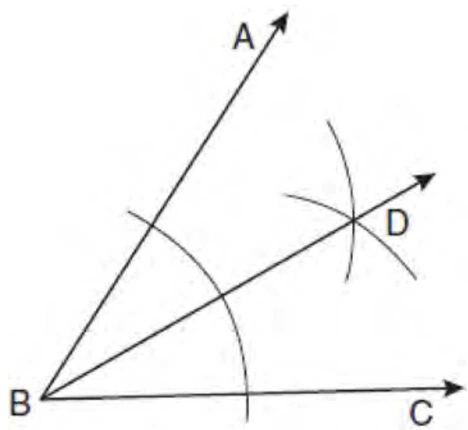
Which statement is *not* true?

1 $m\angle EBF = \frac{1}{2} m\angle ABC$
2 $m\angle DBF = \frac{1}{2} m\angle ABC$
3 $m\angle EBF = m\angle ABC$
4 $m\angle DBF = m\angle EBF$

171 Using a compass and straightedge, construct the angle bisector of $\angle ABC$ shown below. [Leave all construction marks.]



172 Based on the construction below, which statement must be true?



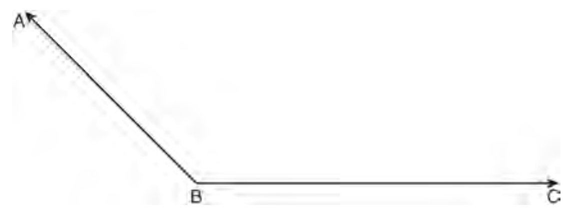
1 $m\angle ABD = \frac{1}{2} m\angle CBD$

2 $m\angle ABD = m\angle CBD$

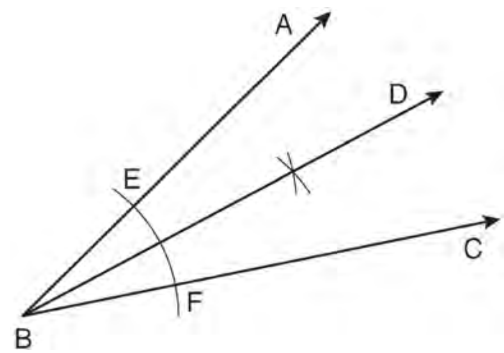
3 $m\angle ABD = m\angle ABC$

4 $m\angle CBD = \frac{1}{2} m\angle ABD$

173 On the diagram below, use a compass and straightedge to construct the bisector of $\angle ABC$. [Leave all construction marks.]



174 A straightedge and compass were used to create the construction below. Arc *EF* was drawn from point *B*, and arcs with equal radii were drawn from *E* and *F*.



Which statement is *false*?

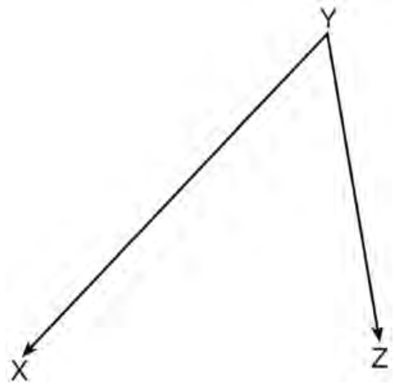
1 $m\angle ABD = m\angle DBC$

2 $\frac{1}{2}(m\angle ABC) = m\angle ABD$

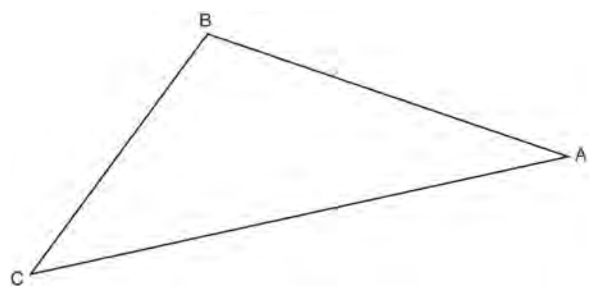
3 $2(m\angle DBC) = m\angle ABC$

4 $2(m\angle ABC) = m\angle CBD$

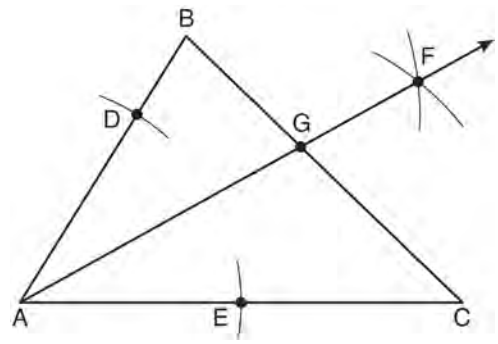
175 On the diagram below, use a compass and straightedge to construct the bisector of $\angle XYZ$. [Leave all construction marks.]



176 Using a compass and straightedge, construct the bisector of $\angle CBA$. [Leave all construction marks.]



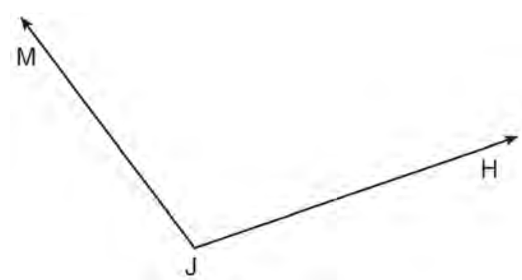
177 As shown in the diagram below of $\triangle ABC$, a compass is used to find points D and E, equidistant from point A. Next, the compass is used to find point F, equidistant from points D and E. Finally, a straightedge is used to draw $\overrightarrow{AF}$. Then, point G, the intersection of $\overrightarrow{AF}$ and side $\overline{BC}$ of $\triangle ABC$, is labeled.



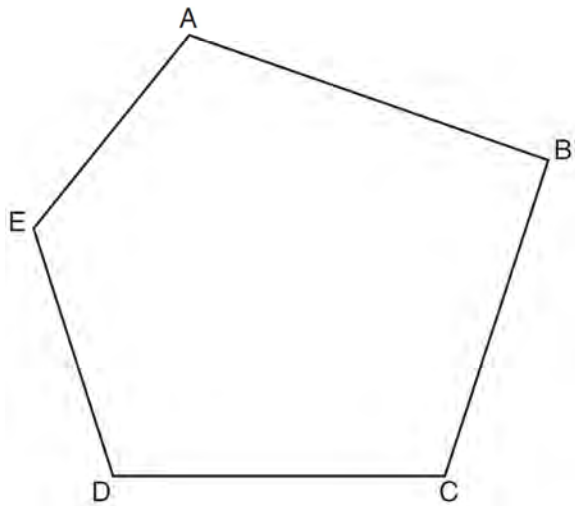
Which statement must be true?

1 $\overrightarrow{AF}$ bisects side $\overline{BC}$
2 $\overrightarrow{AF}$ bisects $\angle BAC$
3 $\overrightarrow{AF} \perp \overline{BC}$
4 $\triangle ABG \sim \triangle ACG$

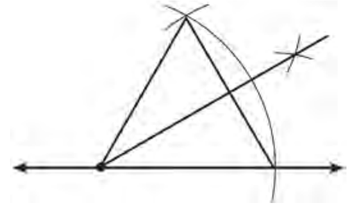
178 Using a compass and straightedge, construct the bisector of $\angle MJH$. [Leave all construction marks.]

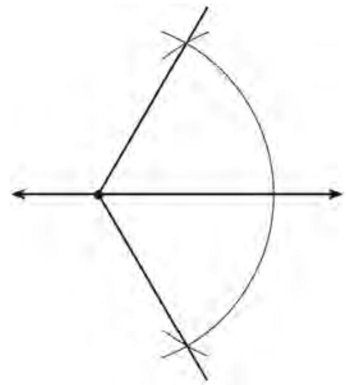


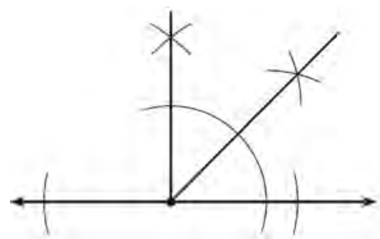
179 Using a compass and a straightedge, construct the bisector of $\angle CDE$. [Leave all construction marks.]

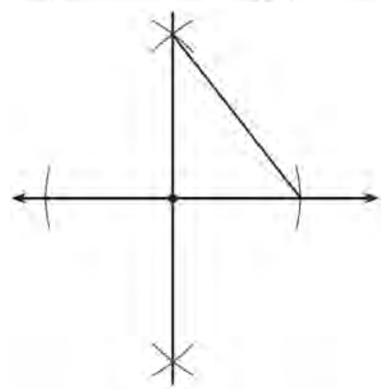


180 Which diagram shows the construction of a 45° angle?

1 

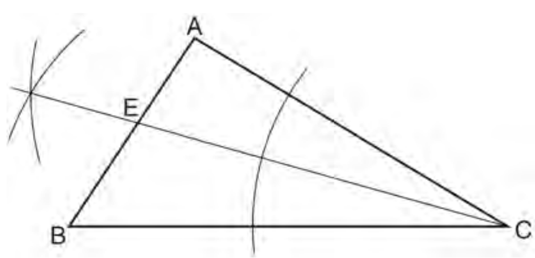
2 

3 

4 

181 Using a compass and straightedge, construct an equilateral triangle with $\overline{AB}$ as a side. Using this triangle, construct a 30° angle with its vertex at A. [Leave all construction marks.]

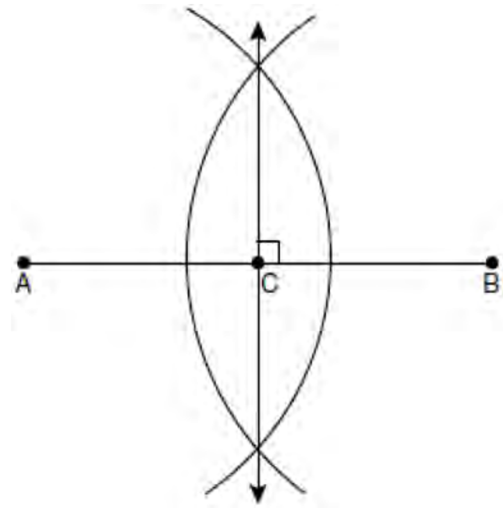
182 A student used a compass and a straightedge to construct $\overline{CE}$ in $\triangle ABC$ as shown below.



Which statement must always be true for this construction?
1 $\angle CEA \cong \angle CEB$
2 $\angle ACE \cong \angle BCE$
3 $\overline{AE} \cong \overline{BE}$
4 $\overline{EC} \cong \overline{AC}$

G.G.18: CONSTRUCTIONS

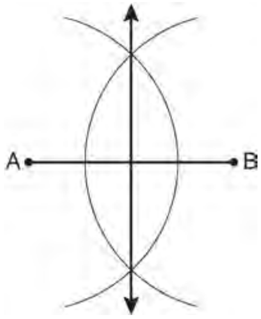
183 The diagram below shows the construction of the perpendicular bisector of $\overline{AB}$.

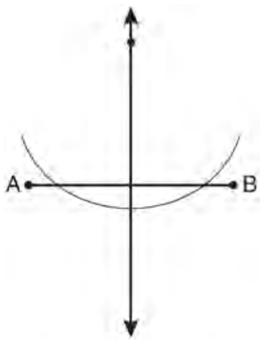


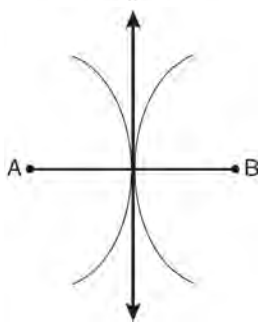
Which statement is *not* true?
1 $AC = CB$
2 $CB = \frac{1}{2}AB$
3 $AC = 2AB$
4 $AC + CB = AB$

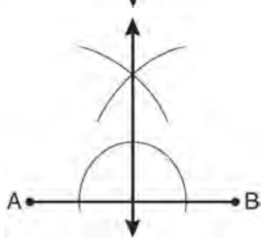
184 One step in a construction uses the endpoints of $\overline{AB}$ to create arcs with the same radii. The arcs intersect above and below the segment. What is the relationship of $\overline{AB}$ and the line connecting the points of intersection of these arcs?
1 collinear
2 congruent
3 parallel
4 perpendicular

185 Which diagram shows the construction of the perpendicular bisector of $\overline{AB}$?

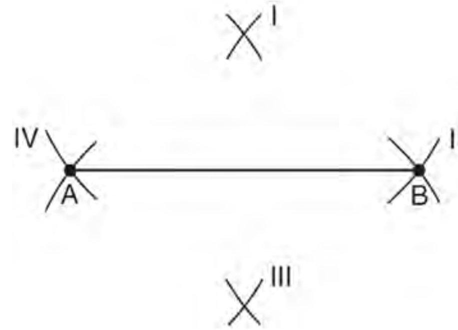
1 

2 

3 

4 

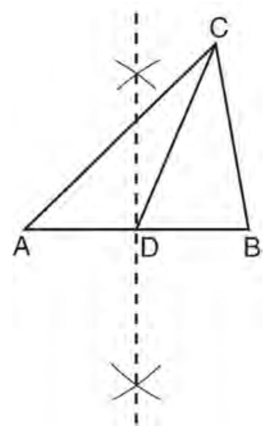
186 Line segment AB is shown in the diagram below.



Which two sets of construction marks, labeled I, II, III, and IV, are part of the construction of the perpendicular bisector of line segment AB?

1 I and II
2 I and III
3 II and III
4 II and IV

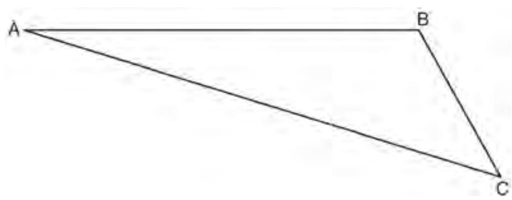
187 In the construction shown below, $\overline{CD}$ is drawn.



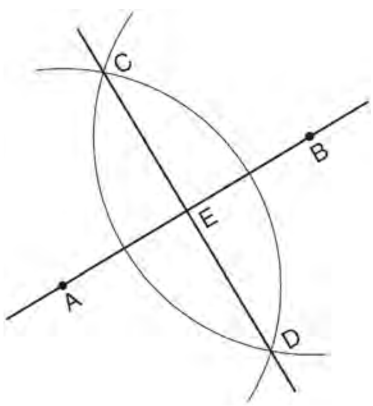
In $\triangle ABC$, $\overline{CD}$ is the

1 perpendicular bisector of side $\overline{AB}$
2 median to side $\overline{AB}$
3 altitude to side $\overline{AB}$
4 bisector of $\angle ACB$

188 On the diagram of $\triangle ABC$ shown below, use a compass and straightedge to construct the perpendicular bisector of $\overline{AC}$. [Leave all construction marks.]

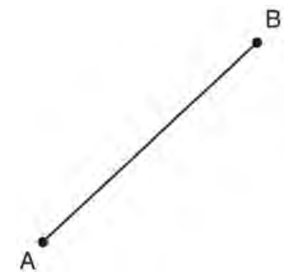


189 Based on the construction below, which conclusion is *not* always true?



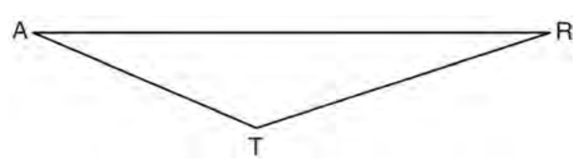
1 $\overline{AB} \perp \overline{CD}$
2 $AB = CD$
3 $AE = EB$
4 $CE = DE$

190 Using a compass and straightedge, construct the perpendicular bisector of $\overline{AB}$. [Leave all construction marks.]

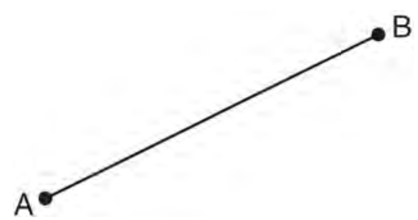


191 Use a compass and straightedge to divide line segment AB below into four congruent parts. [Leave all construction marks.]

192 Using a compass and straightedge, construct the perpendicular bisector of side $\overline{AR}$ in $\triangle ART$ shown below. [Leave all construction marks.]

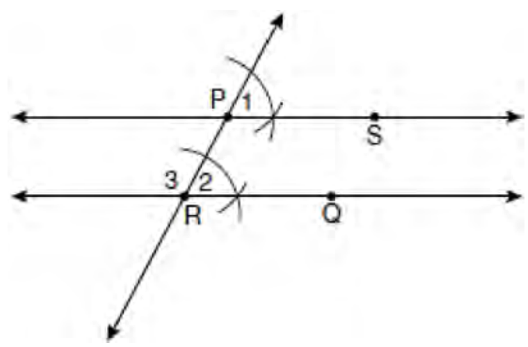


193 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction. [Leave all construction marks.]



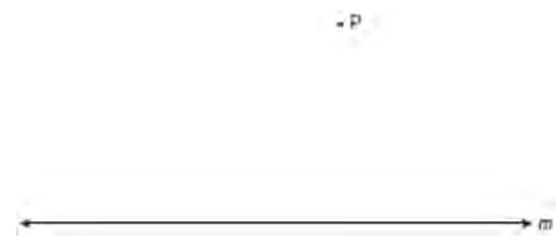
G.G.19: CONSTRUCTIONS

194 The diagram below illustrates the construction of $\overleftrightarrow{PS}$ parallel to $\overleftrightarrow{RQ}$ through point *P*.

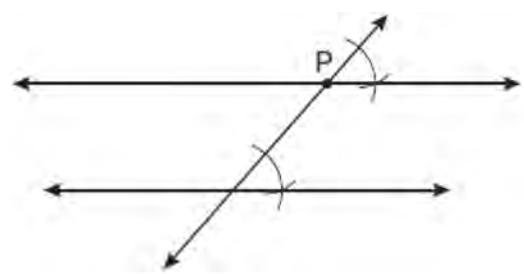


Which statement justifies this construction?
1 $m\angle 1 = m\angle 2$
2 $m\angle 1 = m\angle 3$
3 $\overline{PR} \cong \overline{RQ}$
4 $\overline{PS} \cong \overline{RQ}$

195 Using a compass and straightedge, construct a line that passes through point *P* and is perpendicular to line *m*. [Leave all construction marks.]

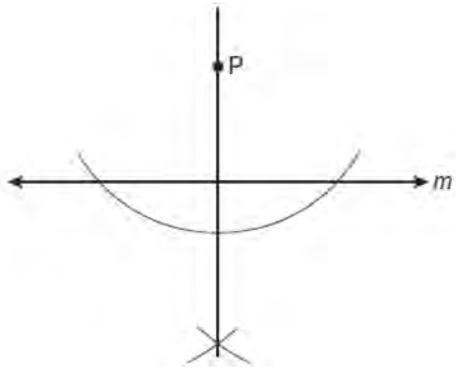


196 Which geometric principle is used to justify the construction below?



1 A line perpendicular to one of two parallel lines is perpendicular to the other.
2 Two lines are perpendicular if they intersect to form congruent adjacent angles.
3 When two lines are intersected by a transversal and alternate interior angles are congruent, the lines are parallel.
4 When two lines are intersected by a transversal and the corresponding angles are congruent, the lines are parallel.

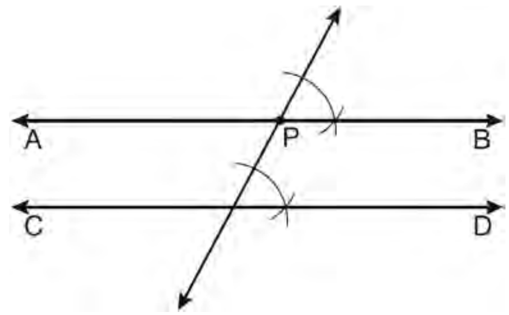
197 The diagram below shows the construction of a line through point P perpendicular to line m.



Which statement is demonstrated by this construction?

1 If a line is parallel to a line that is perpendicular to a third line, then the line is also perpendicular to the third line.
2 The set of points equidistant from the endpoints of a line segment is the perpendicular bisector of the segment.
3 Two lines are perpendicular if they are equidistant from a given point.
4 Two lines are perpendicular if they intersect to form a vertical line.

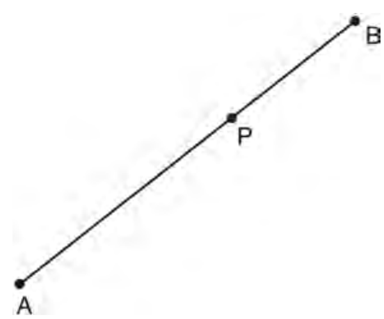
198 The diagram below shows the construction of $\overleftrightarrow{AB}$ through point P parallel to $\overleftrightarrow{CD}$.



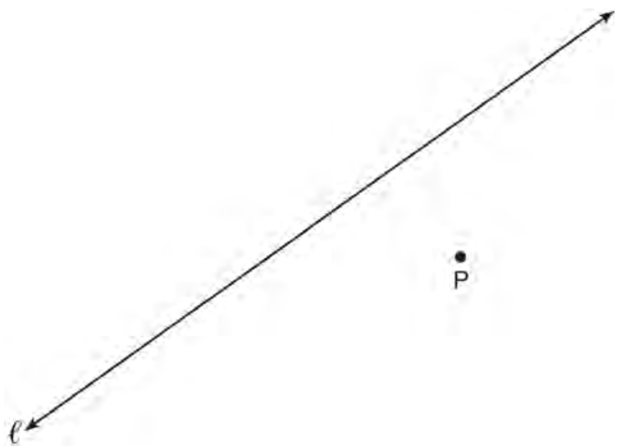
Which theorem justifies this method of construction?

1 If two lines in a plane are perpendicular to a transversal at different points, then the lines are parallel.
2 If two lines in a plane are cut by a transversal to form congruent corresponding angles, then the lines are parallel.
3 If two lines in a plane are cut by a transversal to form congruent alternate interior angles, then the lines are parallel.
4 If two lines in a plane are cut by a transversal to form congruent alternate exterior angles, then the lines are parallel.

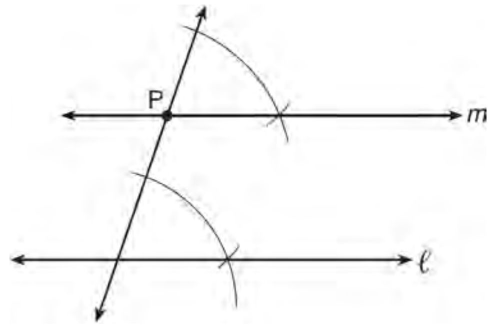
199 Using a compass and straightedge, construct a line perpendicular to $\overline{AB}$ through point P. [Leave all construction marks.]



200 Using a compass and straightedge, construct a line perpendicular to line ℓ through point P. [Leave all construction marks.]



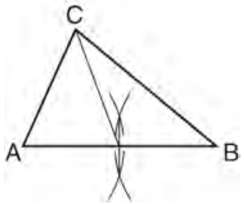
201 The diagram below shows the construction of line m, parallel to line ℓ, through point P.



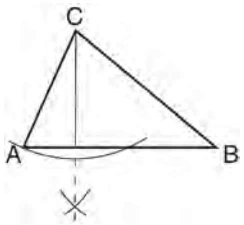
Which theorem was used to justify this construction?

1 If two lines are cut by a transversal and the alternate interior angles are congruent, the lines are parallel.
2 If two lines are cut by a transversal and the interior angles on the same side are supplementary, the lines are parallel.
3 If two lines are perpendicular to the same line, they are parallel.
4 If two lines are cut by a transversal and the corresponding angles are congruent, they are parallel.

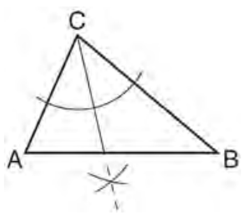
202 Which diagram illustrates a correct construction of an altitude of $\triangle ABC$?



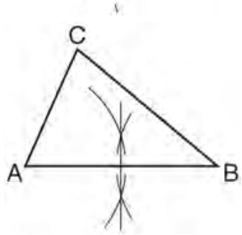
1



2

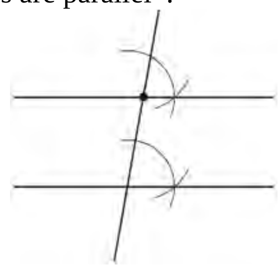


3

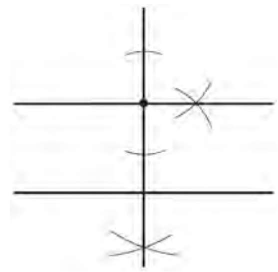


4

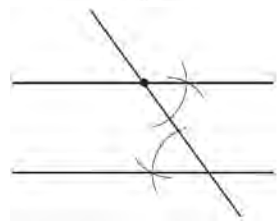
203 Which construction of parallel lines is justified by the theorem "If two lines are cut by a transversal to form congruent alternate interior angles, then the lines are parallel"?



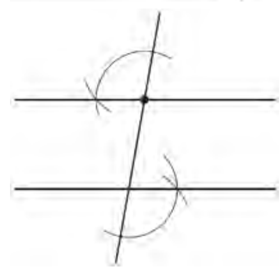
1



2



3

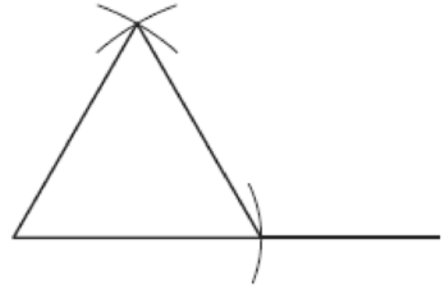


4

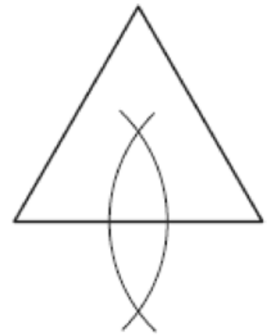
G.G.20: CONSTRUCTIONS

204 Using a compass and straightedge, and $\overline{AB}$ below, construct an equilateral triangle with all sides congruent to $\overline{AB}$. [Leave all construction marks.]

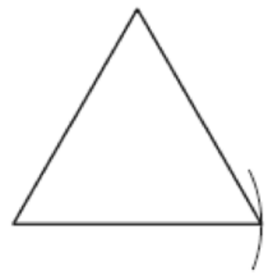
205 Which diagram shows the construction of an equilateral triangle?



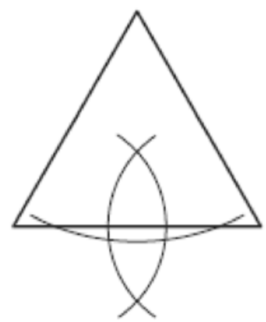
1



2



3

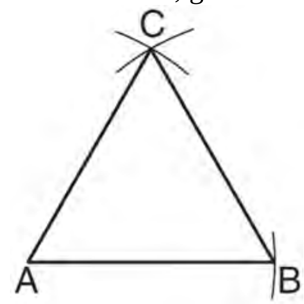


4

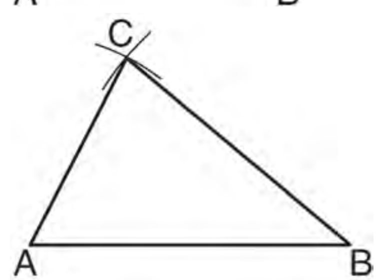
206 On the line segment below, use a compass and straightedge to construct equilateral triangle *ABC*. [Leave all construction marks.]

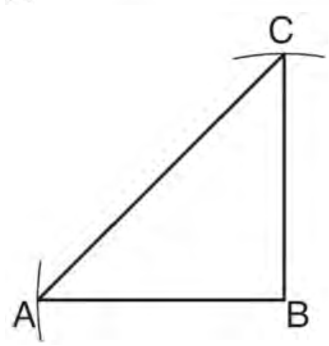
207 Using a compass and straightedge, on the diagram below of $\overleftrightarrow{RS}$, construct an equilateral triangle with $\overline{RS}$ as one side. [Leave all construction marks.]

208 Which diagram represents a correct construction of equilateral $\triangle ABC$, given side $\overline{AB}$?

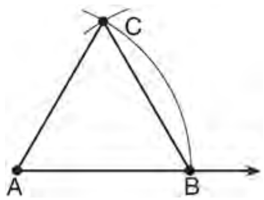
1 

2 

3 

4 

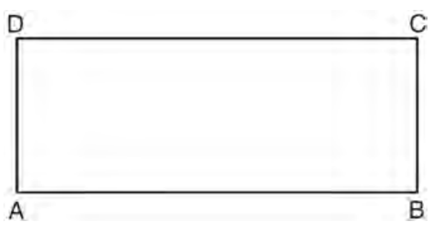
209 The diagram below shows the construction of an equilateral triangle.



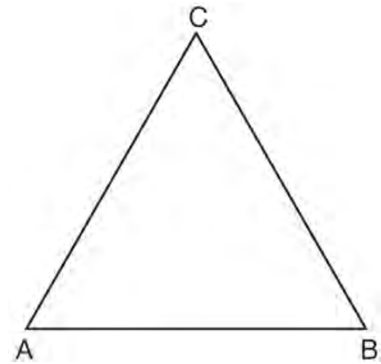
Which statement justifies this construction?

1 $\angle A + \angle B + \angle C = 180$
2 $m\angle A = m\angle B = m\angle C$
3 $AB = AC = BC$
4 $AB + BC > AC$

210 On the ray drawn below, using a compass and straightedge, construct an equilateral triangle with a vertex at *R*. The length of a side of the triangle must be equal to a length of the diagonal of rectangle *ABCD*.



211 In the diagram below, $\triangle ABC$ is equilateral.



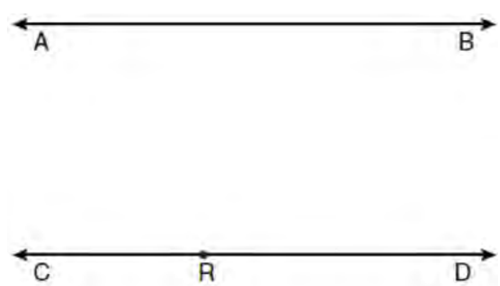
Using a compass and straightedge, construct a new equilateral triangle congruent to $\triangle ABC$ in the space below. [Leave all construction marks.]

G.G.22: LOCUS

212 The length of $\overline{AB}$ is 3 inches. On the diagram below, sketch the points that are equidistant from *A* and *B* and sketch the points that are 2 inches from A. Label with an **X** all points that satisfy both conditions.

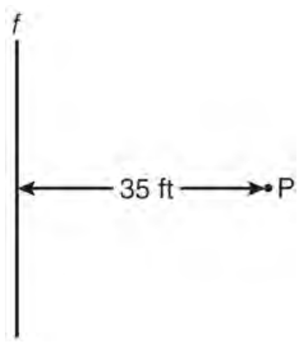
213 Towns *A* and *B* are 16 miles apart. How many points are 10 miles from town *A* and 12 miles from town *B*?
1 1
2 2
3 3
4 0

214 Two lines, $\overleftrightarrow{AB}$ and $\overleftrightarrow{CRD}$, are parallel and 10 inches apart. Sketch the locus of all points that are equidistant from $\overleftrightarrow{AB}$ and $\overleftrightarrow{CRD}$ and 7 inches from point *R*. Label with an **X** each point that satisfies both conditions.



215 In the diagram below, car A is parked 7 miles from car B. Sketch the points that are 4 miles from car A and sketch the points that are 4 miles from car B. Label with an **X** all points that satisfy both conditions.

216 A man wants to place a new bird bath in his yard so that it is 30 feet from a fence, f, and also 10 feet from a light pole, P. As shown in the diagram below, the light pole is 35 feet away from the fence.



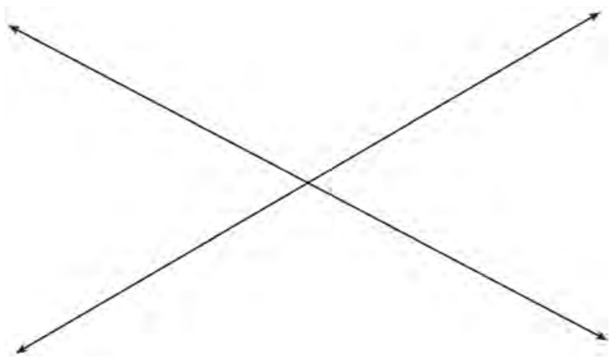
How many locations are possible for the bird bath?
1 1
2 2
3 3
4 0

217 In the diagram below, point M is located on $\overleftrightarrow{AB}$. Sketch the locus of points that are 1 unit from $\overleftrightarrow{AB}$ and the locus of points 2 units from point M. Label with an **X** all points that satisfy both conditions.

218 How many points are 5 units from a line and also equidistant from two points on the line?
1 1
2 2
3 3
4 0

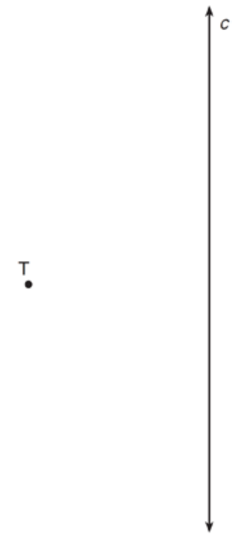
219 In a park, two straight paths intersect. The city wants to install lampposts that are both equidistant from each path and also 15 feet from the intersection of the paths. How many lampposts are needed?
1 1
2 2
3 3
4 4

220 Two intersecting lines are shown in the diagram below. Sketch the locus of points that are equidistant from the two lines. Sketch the locus of points that are a given distance, d, from the point of intersection of the given lines. State the number of points that satisfy both conditions.

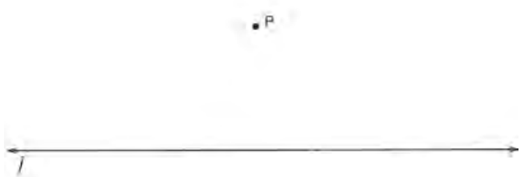


221 Points A and B are on line ℓ. How many points are 3 units from line ℓ and also equidistant from A and B?
1 1
2 2
3 3
4 4

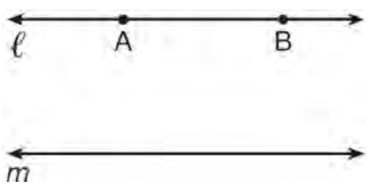
222 A tree, T, is 6 meters from a row of corn, c, as represented in the diagram below. A farmer wants to place a scarecrow 2 meters from the row of corn and also 5 meters from the tree. Sketch both loci. Indicate, with an **X**, all possible locations for the scarecrow.



223 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.



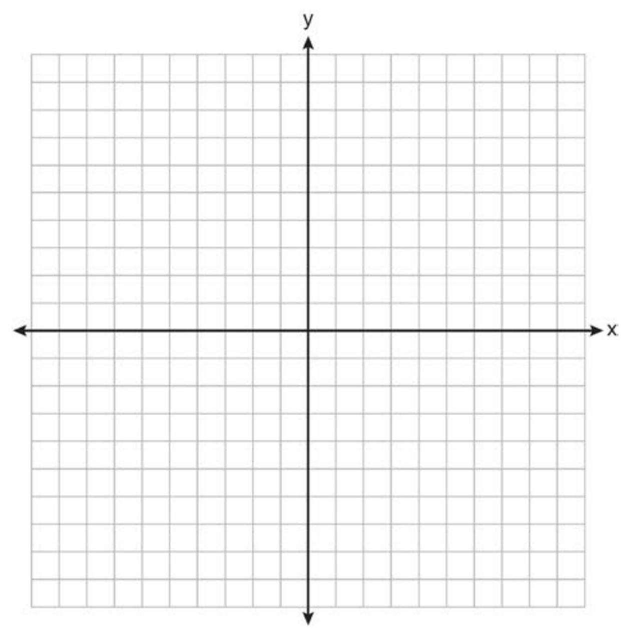
224 Points A and B are on line ℓ, and line ℓ is parallel to line m, as shown in the diagram below.



How many points are in the same plane as ℓ and m and equidistant from ℓ and m, and also equidistant from A and B?
1 1
2 2
3 3
4 0

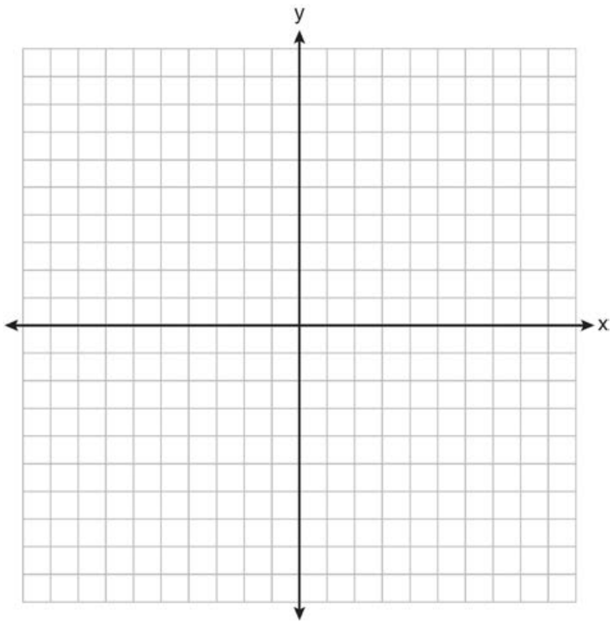
G.G.23: LOCUS

225 A city is planning to build a new park. The park must be equidistant from school A at $(3,3)$ and school B at $(3,-5)$. The park also must be exactly 5 miles from the center of town, which is located at the origin on the coordinate graph. Each unit on the graph represents 1 mile. On the set of axes below, sketch the compound loci and label with an **X** all possible locations for the new park.

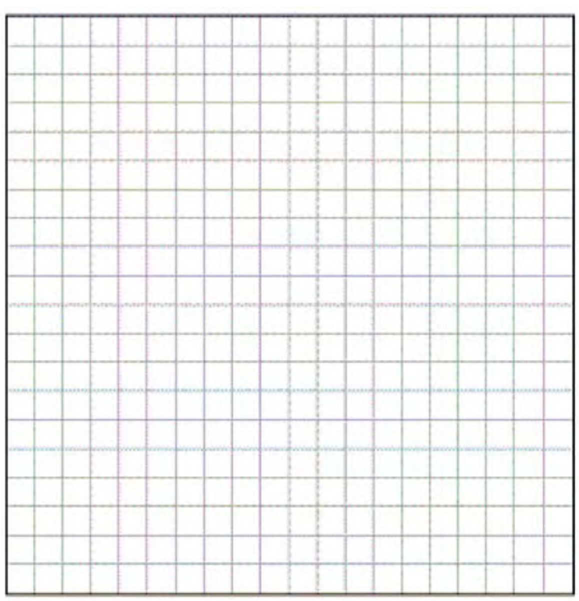


226 In a coordinate plane, how many points are both 5 units from the origin and 2 units from the x-axis?
1 1
2 2
3 3
4 4

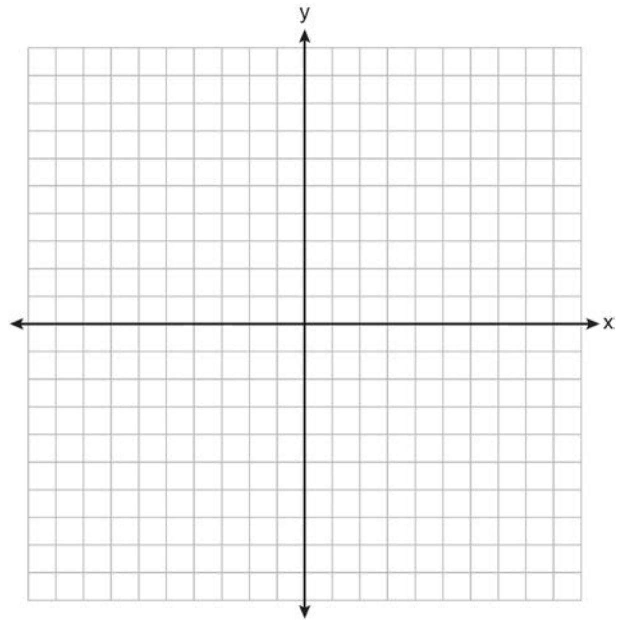
227 On the set of axes below, sketch the points that are 5 units from the origin and sketch the points that are 2 units from the line $y = 3$. Label with an **X** all points that satisfy both conditions.



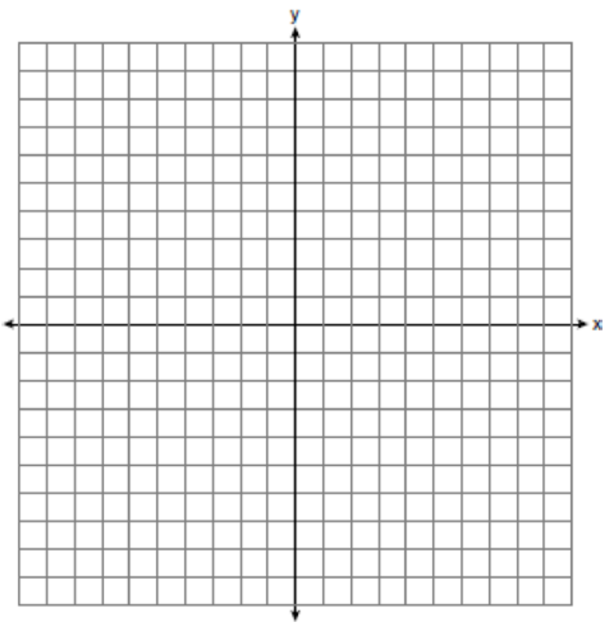
228 On the grid below, graph the points that are equidistant from both the x and y axes and the points that are 5 units from the origin. Label with an **X** all points that satisfy *both* conditions.



229 On the set of axes below, graph the locus of points that are four units from the point $(2,1)$. On the same set of axes, graph the locus of points that are two units from the line $x = 4$. State the coordinates of all points that satisfy both conditions.



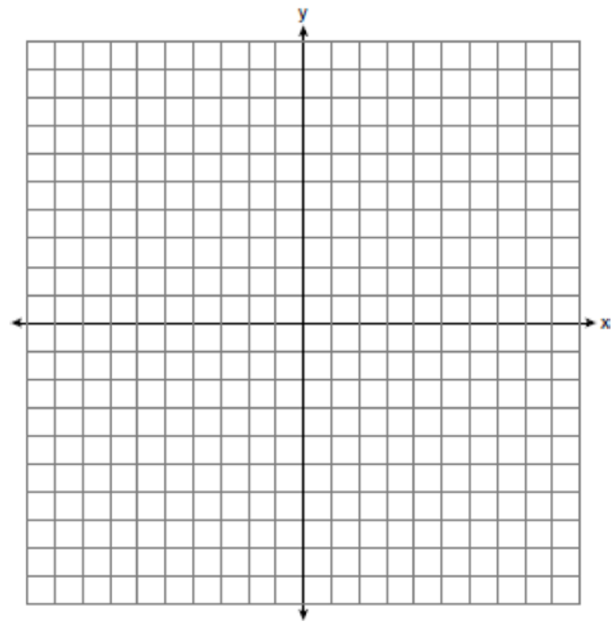
230 On the set of coordinate axes below, graph the locus of points that are equidistant from the lines $y = 6$ and $y = 2$ and also graph the locus of points that are 3 units from the y-axis. State the coordinates of *all* points that satisfy *both* conditions.



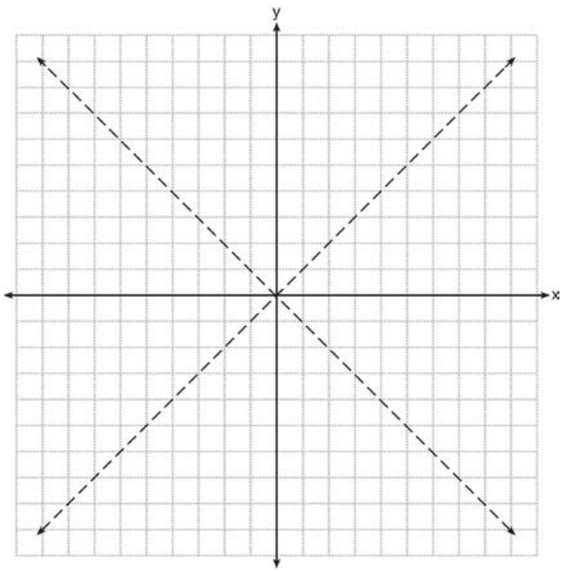
231 How many points are both 4 units from the origin and also 2 units from the line $y = 4$?

1 1
2 2
3 3
4 4

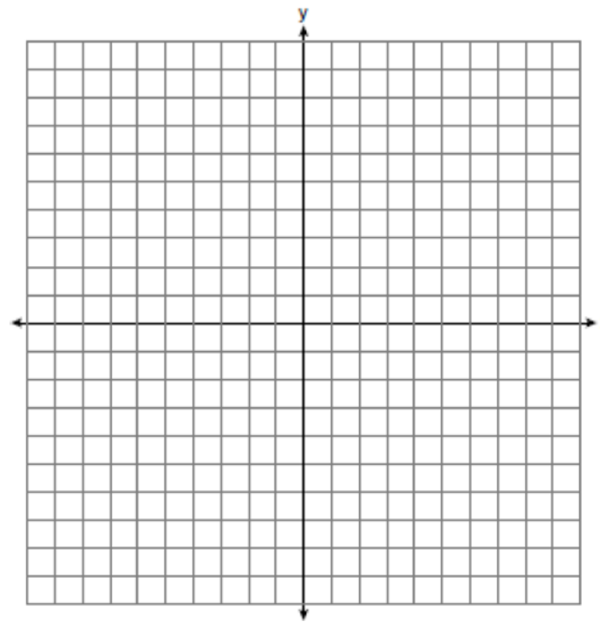
232 On the set of axes below, graph the locus of points that are 4 units from the line $x = 3$ and the locus of points that are 5 units from the point $(0,2)$. Label with an **X** all points that satisfy both conditions.



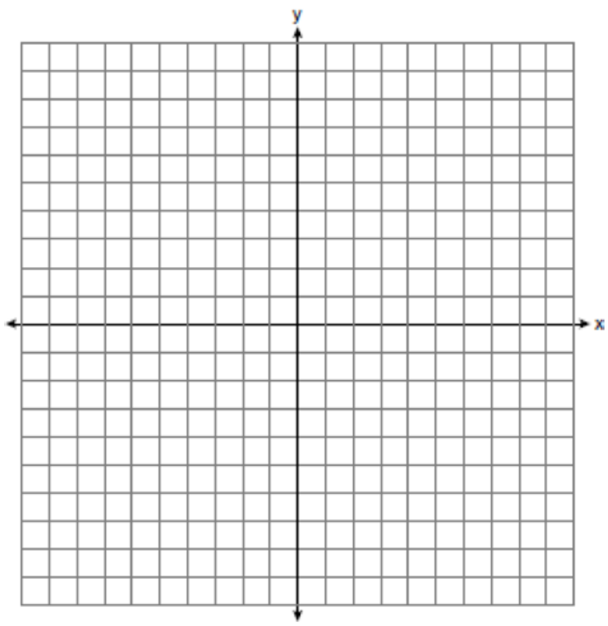
233 The graph below shows the locus of points equidistant from the x-axis and y-axis. On the same set of axes, graph the locus of points 3 units from the line $x = 0$. Label with an **X** *all* points that satisfy both conditions.



234 On the set of axes below, graph the locus of points 4 units from $(0,1)$ and the locus of points 3 units from the origin. Label with an **X** *any* points that satisfy *both* conditions.



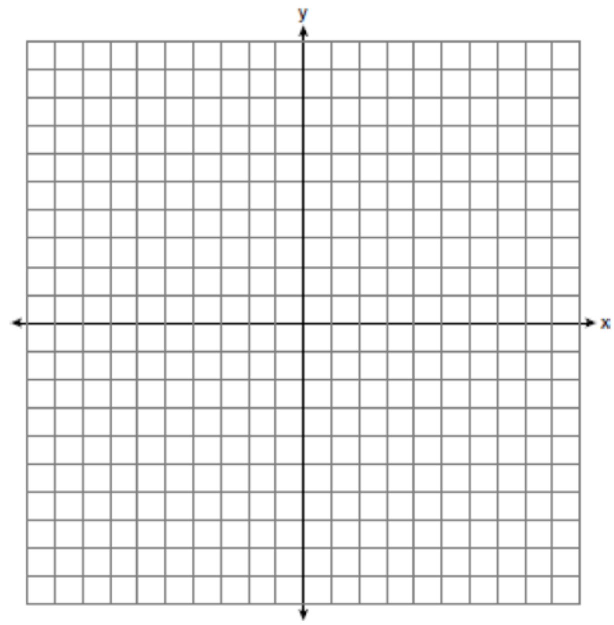
235 On the set of axes below, graph the locus of points 4 units from the x-axis and equidistant from the points whose coordinates are $(-2,0)$ and $(8,0)$. Mark with an **X** all points that satisfy *both* conditions.



236 In a coordinate plane, the locus of points 5 units from the x-axis is the
1 lines $x = 5$ and $x = -5$
2 lines $y = 5$ and $y = -5$
3 line $x = 5$, only
4 line $y = 5$, only

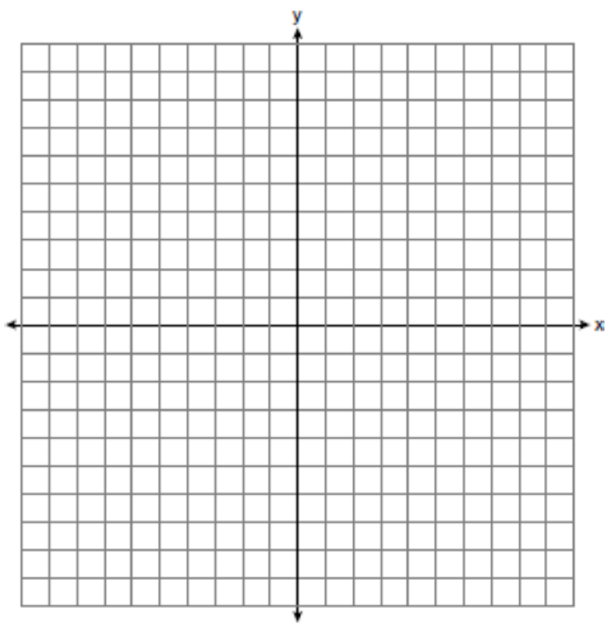
237 How many points in the coordinate plane are 3 units from the origin and also equidistant from both the x-axis and the y-axis?
1 1
2 2
3 8
4 4

238 On the set of axes below, sketch the locus of points 2 units from the x-axis and sketch the locus of points 6 units from the point $(0,4)$. Label with an **X** all points that satisfy both conditions.

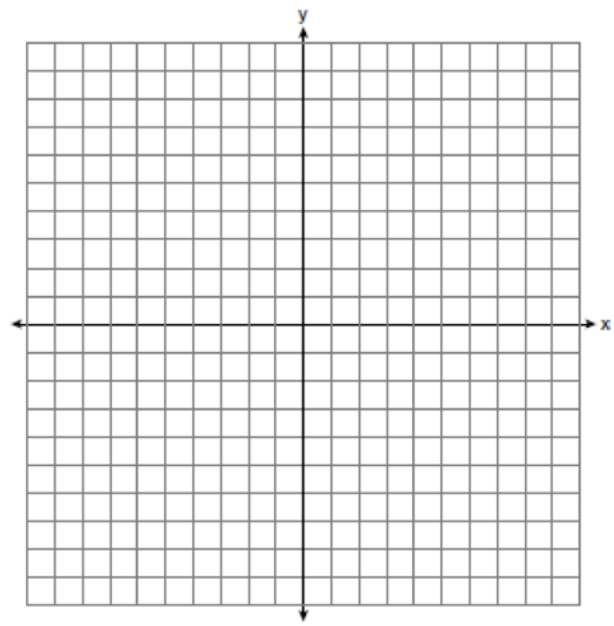


239 How many points are 3 units from the origin and also equidistant from both the x-axis and y-axis?
1 1
2 2
3 0
4 4

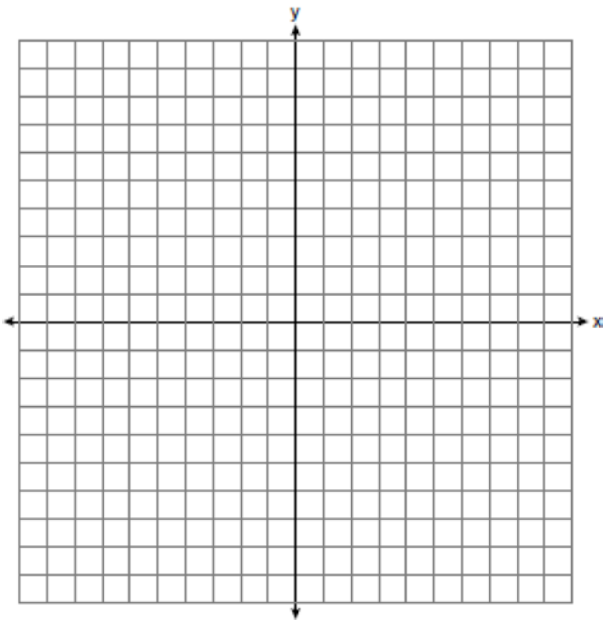
240 On the set of axes below, graph the locus of points 5 units from the point $(3,-2)$. On the same set of axes, graph the locus of points equidistant from the points $(0,-6)$ and $(2,-4)$. State the coordinates of all points that satisfy *both* conditions.



241 On the set of axes below, graph two horizontal lines whose *y*-intercepts are $(0,-2)$ and $(0,6)$, respectively. Graph the locus of points equidistant from these horizontal lines. Graph the locus of points 3 units from the *y*-axis. State the coordinates of the points that satisfy both loci.



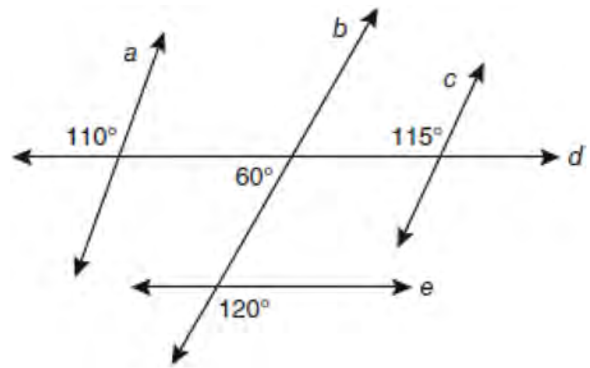
242 On the set of axes below, graph the locus of points 5 units from the point $(2,-3)$ and the locus of points 2 units from the line whose equation is $y=-1$. State the coordinates of all points that satisfy *both* conditions.



ANGLES

G.G.35: PARALLEL LINES & TRANSVERSALS

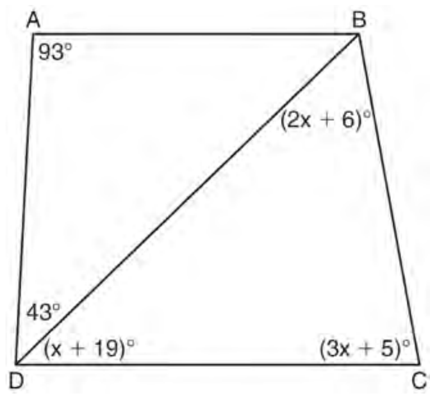
243 Based on the diagram below, which statement is true?



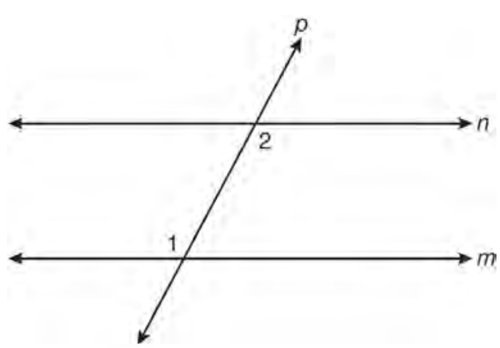
1 $a \parallel b$
2 $a \parallel c$
3 $b \parallel c$
4 $d \parallel e$

244 A transversal intersects two lines. Which condition would always make the two lines parallel?
1 Vertical angles are congruent.
2 Alternate interior angles are congruent.
3 Corresponding angles are supplementary.
4 Same-side interior angles are complementary.

245 In the diagram below of quadrilateral $ABCD$ with diagonal $\overline{BD}$, $m\angle A = 93$, $m\angle ADB = 43$, $m\angle C = 3x + 5$, $m\angle BDC = x + 19$, and $m\angle DBC = 2x + 6$. Determine if $\overline{AB}$ is parallel to $\overline{DC}$. Explain your reasoning.

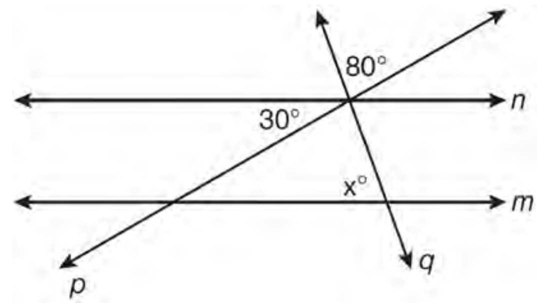


246 In the diagram below, line p intersects line m and line n.



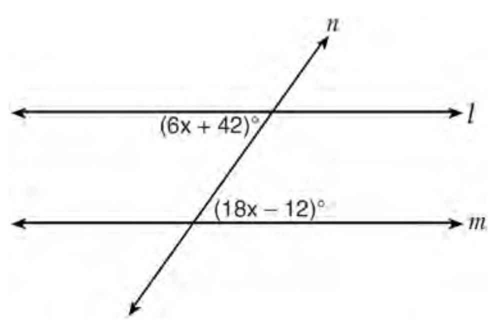
If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines m and n are parallel when x equals
1 12.5
2 15
3 87.5
4 105

247 In the diagram below, lines n and m are cut by transversals p and q.



What value of x would make lines n and m parallel?
1 110
2 80
3 70
4 50

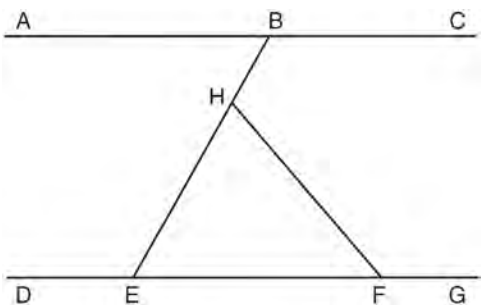
248 Line n intersects lines l and m, forming the angles shown in the diagram below.



Which value of x would prove $l \parallel m$?
1 2.5
2 4.5
3 6.25
4 8.75

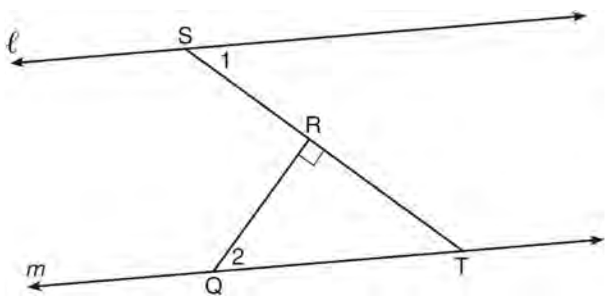
Geometry Regents Exam Questions by Performance Indicator: Topic

249 In the diagram below, $\overline{ABC} \parallel \overline{DEFG}$. Transversal $\overline{BHE}$ and line segment HF are drawn.



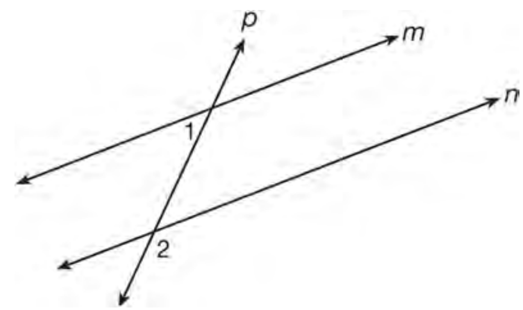
If m∠HFG = 130 and m∠EHF = 70, what is m∠ABE?
1 40
2 50
3 60
4 70

250 In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$ at R.



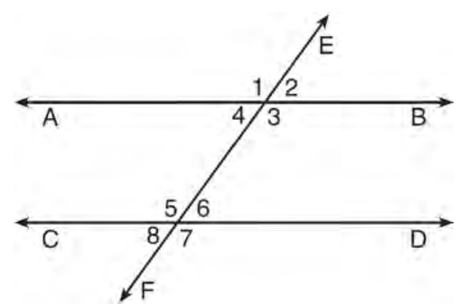
If m∠1 = 63, find m∠2.

251 As shown in the diagram below, lines m and n are cut by transversal p.



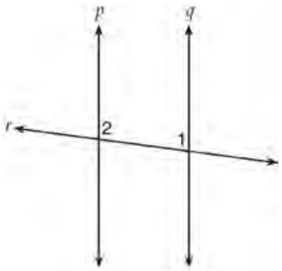
If m∠1 = $4x + 14$ and m∠2 = $8x + 10$, lines m and n are parallel when x equals
1 1
2 6
3 13
4 17

252 Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.



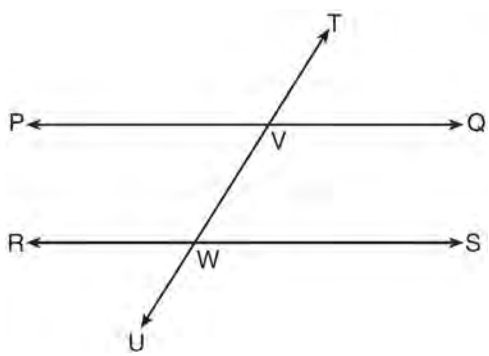
Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?
1 ∠2 ≅ ∠4
2 ∠7 ≅ ∠8
3 ∠3 and ∠6 are supplementary
4 ∠1 and ∠5 are supplementary

253 Lines p and q are intersected by line r, as shown below.



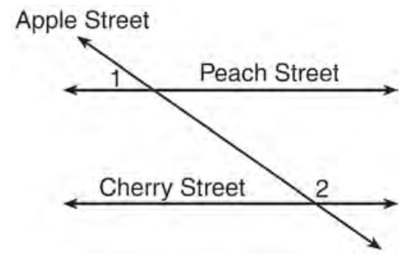
If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?
1 17
2 24
3 83
4 97

254 In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.



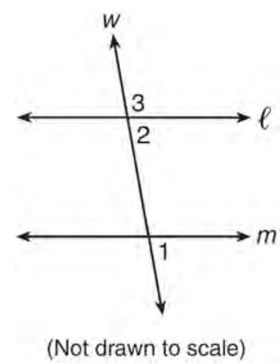
If $m\angle TVQ = 5x - 22$ and $m\angle VWS = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?
1 6
2 16
3 24
4 28

255 Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?
1 9
2 17
3 54
4 70

256 In the diagram below, line ℓ is parallel to line m, and line w is a transversal.

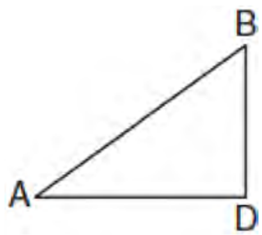


If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?
1 19
2 23
3 74
4 86

TRIANGLES

G.G.48: PYTHAGOREAN THEOREM

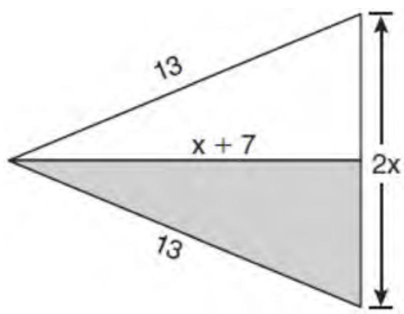
257 In the diagram below of $\triangle ADB$, $m\angle BDA = 90$, $AD = 5\sqrt{2}$, and $AB = 2\sqrt{15}$.



What is the length of $\overline{BD}$?

1 $\sqrt{10}$
2 $\sqrt{20}$
3 $\sqrt{50}$
4 $\sqrt{110}$

258 The diagram below shows a pennant in the shape of an isosceles triangle. The equal sides each measure 13, the altitude is $x + 7$, and the base is $2x$.



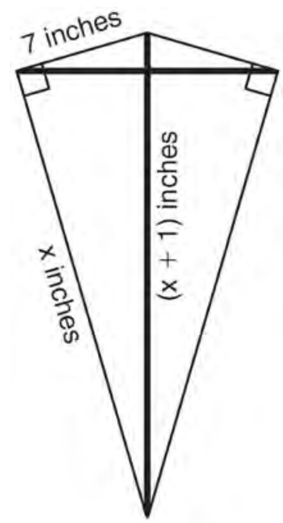
What is the length of the base?

1 5
2 10
3 12
4 24

259 Which set of numbers does *not* represent the sides of a right triangle?

1 $\{6,8,10\}$
2 $\{8,15,17\}$
3 $\{8,24,25\}$
4 $\{15,36,39\}$

260 As shown in the diagram below, a kite needs a vertical and a horizontal support bar attached at opposite corners. The upper edges of the kite are 7 inches, the side edges are *x* inches, and the vertical support bar is $(x + 1)$ inches.



What is the measure, in inches, of the vertical support bar?

1 23
2 24
3 25
4 26

261 Which set of numbers could *not* represent the lengths of the sides of a right triangle?

1 $\{1,3,\sqrt{10}\}$
2 $\{2,3,4\}$
3 $\{3,4,5\}$
4 $\{8,15,17\}$

262 Which set of numbers could represent the lengths of the sides of a right triangle?
1 $\{2,3,4\}$
2 $\{5,9,13\}$
3 $\{7,7,12\}$
4 $\{8,15,17\}$

G.G.30: INTERIOR AND EXTERIOR ANGLES OF TRIANGLES

263 Juliann plans on drawing $\triangle ABC$, where the measure of $\angle A$ can range from 50° to 60° and the measure of $\angle B$ can range from 90° to 100°. Given these conditions, what is the correct range of measures possible for $\angle C$?
1 20° to 40°
2 30° to 50°
3 80° to 90°
4 120° to 130°

264 In an equilateral triangle, what is the difference between the sum of the exterior angles and the sum of the interior angles?
1 180°
2 120°
3 90°
4 60°

265 The degree measures of the angles of $\triangle ABC$ are represented by x, $3x$, and $5x - 54$. Find the value of x.

266 In $\triangle ABC$, $m\angle A = x$, $m\angle B = 2x + 2$, and $m\angle C = 3x + 4$. What is the value of x?
1 29
2 31
3 59
4 61

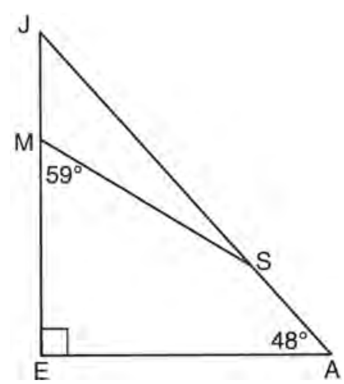
267 In right $\triangle DEF$, $m\angle D = 90$ and $m\angle F$ is 12 degrees less than twice $m\angle E$. Find $m\angle E$.

268 In $\triangle DEF$, $m\angle D = 3x + 5$, $m\angle E = 4x - 15$, and $m\angle F = 2x + 10$. Which statement is true?
1 $DF = FE$
2 $DE = FE$
3 $m\angle E = m\angle F$
4 $m\angle D = m\angle F$

269 Triangle PQR has angles in the ratio of $2:3:5$. Which type of triangle is $\triangle PQR$?
1 acute
2 isosceles
3 obtuse
4 right

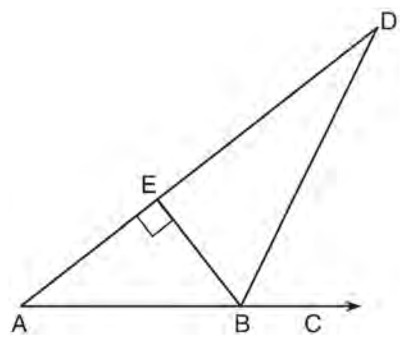
270 The angles of triangle ABC are in the ratio of $8:3:4$. What is the measure of the *smallest* angle?
1 12º
2 24º
3 36º
4 72º

271 In the diagram of $\triangle JEA$ below, $m\angle JEA = 90$ and $m\angle EAJ = 48$. Line segment MS connects points M and S on the triangle, such that $m\angle EMS = 59$.



What is $m\angle JSM$?
1 163
2 121
3 42
4 17

272 The diagram below shows $\triangle ABD$, with $\overrightarrow{ABC}$, $\overline{BE} \perp \overline{AD}$, and $\angle EBD \cong \angle CBD$.



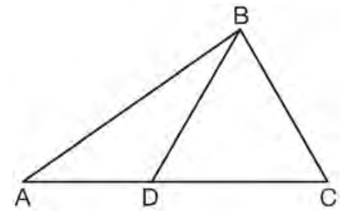
If $m\angle ABE = 52$, what is $m\angle D$?
1 26
2 38
3 52
4 64

273 In $\triangle ABC$, $m\angle A = 3x + 1$, $m\angle B = 4x - 17$, and $m\angle C = 5x - 20$. Which type of triangle is $\triangle ABC$?
1 right
2 scalene
3 isosceles
4 equilateral

274 In $\triangle ABC$, the measure of angle A is fifteen less than twice the measure of angle B. The measure of angle C equals the sum of the measures of angle A and angle B. Determine the measure of angle B.

275 The measures of the angles of a triangle are in the ratio $2:3:4$. In degrees, the measure of the *largest* angle of the triangle is
1 20
2 40
3 80
4 100

276 In the diagram of $\triangle ABC$ below, $\overline{BD}$ is drawn to side $\overline{AC}$.

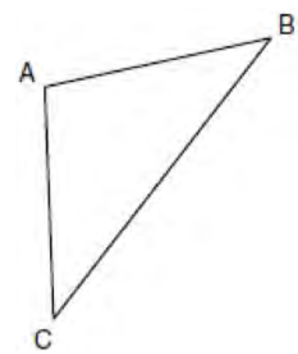


If $m\angle A = 35$, $m\angle ABD = 25$, and $m\angle C = 60$, which type of triangle is $\triangle BCD$?
1 equilateral
2 scalene
3 obtuse
4 right

277 The measures of the angles of a triangle are in the ratio $5:6:7$. Determine the measure, in degrees, of the *smallest* angle of the triangle.

G.G.31: ISOSCELES TRIANGLE THEOREM

278 In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.



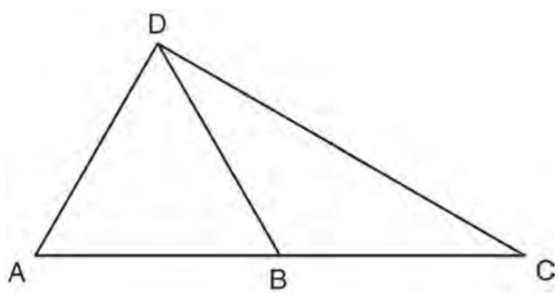
What is the measure of $\angle A$?
1 40°
2 50°
3 70°
4 100°

279 In $\triangle ABC$, $\overline{AB} \cong \overline{BC}$. An altitude is drawn from B to $\overline{AC}$ and intersects $\overline{AC}$ at D. Which conclusion is *not* always true?
1 $\angle ABD \cong \angle CBD$
2 $\angle BDA \cong \angle BDC$
3 $\overline{AD} \cong \overline{BD}$
4 $\overline{AD} \cong \overline{DC}$

280 In $\triangle RST$, $m\angle RST = 46$ and $\overline{RS} \cong \overline{ST}$. Find $m\angle STR$.

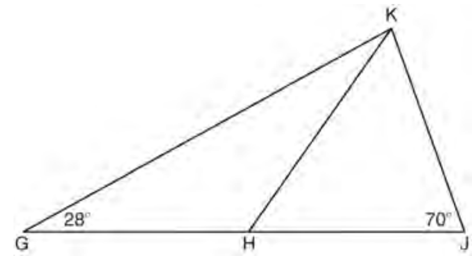
281 In isosceles triangle ABC, $AB = BC$. Which statement will always be true?
1 $m\angle B = m\angle A$
2 $m\angle A > m\angle B$
3 $m\angle A = m\angle C$
4 $m\angle C < m\angle B$

282 In the diagram below of $\triangle ACD$, B is a point on $\overline{AC}$ such that $\triangle ADB$ is an equilateral triangle, and $\triangle DBC$ is an isosceles triangle with $\overline{DB} \cong \overline{BC}$. Find $m\angle C$.

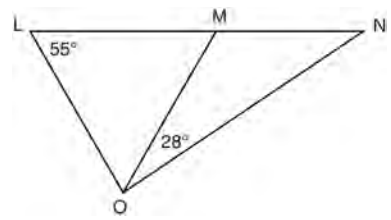


283 If the vertex angles of two isosceles triangles are congruent, then the triangles must be
1 acute
2 congruent
3 right
4 similar

284 In the diagram below of $\triangle GJK$, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, $m\angle G = 28$, and $m\angle GJK = 70$. Determine whether $\triangle GHK$ is an isosceles triangle and justify your answer.

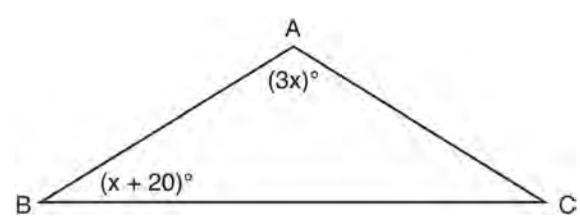


285 In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.



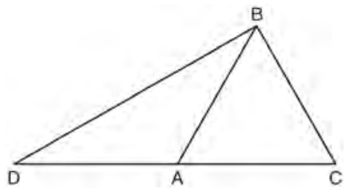
If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?
1 27
2 28
3 42
4 70

286 In the diagram below of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $m\angle A = 3x$, and $m\angle B = x + 20$.



What is the value of x?
1 10
2 28
3 32
4 40

287 In the diagram of $\triangle BCD$ shown below, $\overline{BA}$ is drawn from vertex B to point A on $\overline{DC}$, such that $\overline{BC} \cong \overline{BA}$.

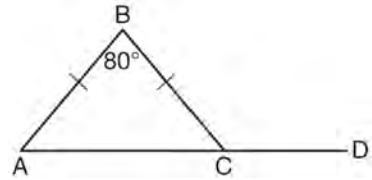


In $\triangle DAB$, $m\angle D = x$, $m\angle DAB = 5x - 30$, and $m\angle DBA = 3x - 60$. In $\triangle ABC$, $AB = 6y - 8$ and $BC = 4y - 2$. [Only algebraic solutions can receive full credit.] Find $m\angle D$. Find $m\angle BAC$. Find the length of $\overline{BC}$. Find the length of $\overline{DC}$.

288 The vertex angle of an isosceles triangle measures 15 degrees more than one of its base angles. How many degrees are there in a base angle of the triangle?
1 50
2 55
3 65
4 70

289 In $\triangle FGH$, $m\angle F = m\angle H$, $GF = x + 40$, $HF = 3x - 20$, and $GH = 2x + 20$. The length of $\overline{GH}$ is
1 20
2 40
3 60
4 80

290 In the diagram below of isosceles $\triangle ABC$, the measure of vertex angle B is 80°. If $\overline{AC}$ extends to point D, what is $m\angle BCD$?



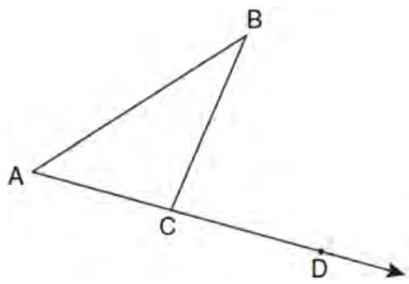
1 50
2 80
3 100
4 130

291 In $\triangle JKL$, $\overline{JL} \cong \overline{KL}$. If $m\angle J = 58$, then $m\angle L$ is
1 61
2 64
3 116
4 122

G.G.32: EXTERIOR ANGLE THEOREM

292 Side $\overline{PQ}$ of $\triangle PQR$ is extended through Q to point T. Which statement is *not* always true?
1 $m\angle RQT > m\angle R$
2 $m\angle RQT > m\angle P$
3 $m\angle RQT = m\angle P + m\angle R$
4 $m\angle RQT > m\angle PQR$

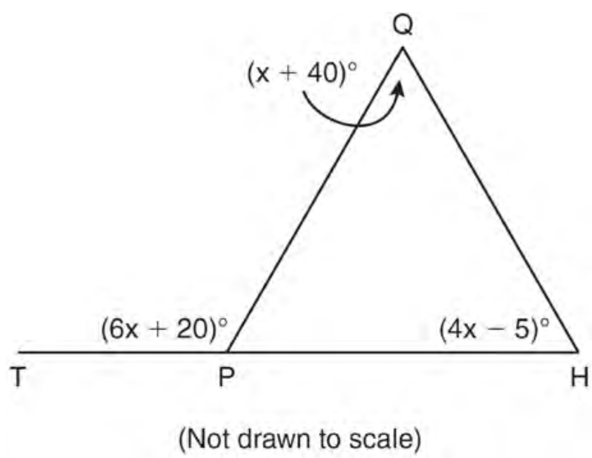
293 In the diagram below, $\triangle ABC$ is shown with $\overline{AC}$ extended through point D.



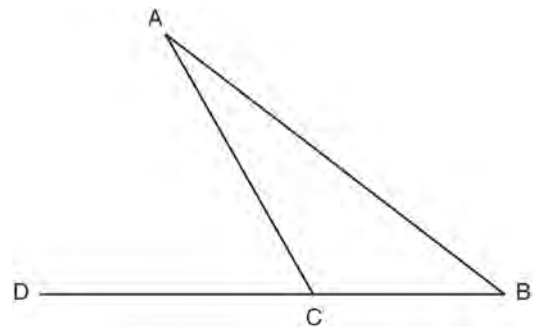
If $m\angle BCD = 6x + 2$, $m\angle BAC = 3x + 15$, and $m\angle ABC = 2x - 1$, what is the value of x?

1 12
2 $14\frac{10}{11}$
3 16
4 $18\frac{1}{9}$

294 In the diagram below of $\triangle HQP$, side $\overline{HP}$ is extended through P to T, $m\angle QPT = 6x + 20$, $m\angle HQP = x + 40$, and $m\angle PHQ = 4x - 5$. Find $m\angle QPT$.



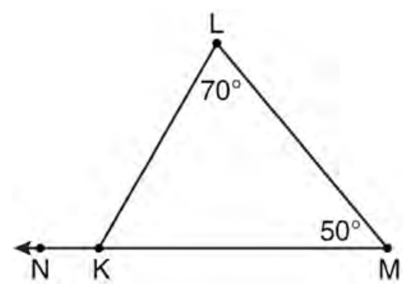
295 In the diagram below of $\triangle ABC$, side $\overline{BC}$ is extended to point D, $m\angle A = x$, $m\angle B = 2x + 15$, and $m\angle ACD = 5x + 5$.



What is $m\angle B$?

1 5
2 20
3 25
4 55

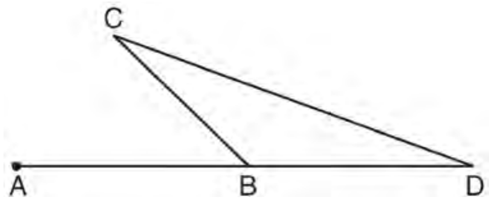
296 In the diagram of $\triangle KLM$ below, $m\angle L = 70$, $m\angle M = 50$, and $\overline{MK}$ is extended through N.



What is the measure of $\angle LKN$?

1 60º
2 120º
3 180º
4 300º

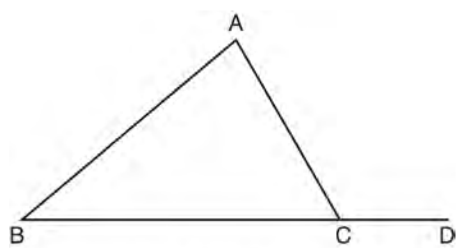
297 In the diagram below of $\triangle BCD$, side $\overline{DB}$ is extended to point A.



Which statement must be true?
1 $m\angle C > m\angle D$
2 $m\angle ABC < m\angle D$
3 $m\angle ABC > m\angle C$
4 $m\angle ABC > m\angle C + m\angle D$

298 In $\triangle FGH$, $m\angle F = 42$ and an exterior angle at vertex H has a measure of 104. What is $m\angle G$?
1 34
2 62
3 76
4 146

299 In the diagram below of $\triangle ABC$, $\overline{BC}$ is extended to D.

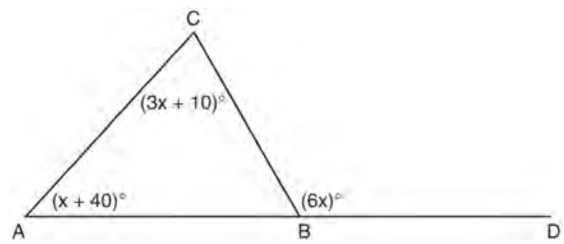


(Not drawn to scale)

If $m\angle A = x^2 - 6x$, $m\angle B = 2x - 3$, and $m\angle ACD = 9x + 27$, what is the value of x?
1 10
2 2
3 3
4 15

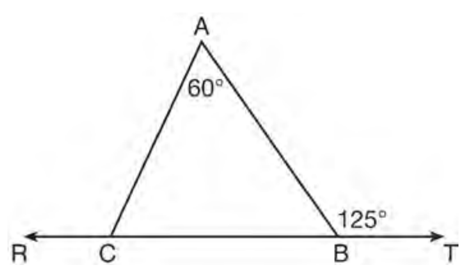
300 In $\triangle ABC$, $m\angle CAB = 2x$ and $m\angle ACB = x + 30$. If $\overline{AB}$ is extended through point B to point D, $m\angle CBD = 5x - 50$. What is the value of x?
1 25
2 30
3 40
4 46

301 In the diagram of $\triangle ABC$ below, $\overline{AB}$ is extended to point D.



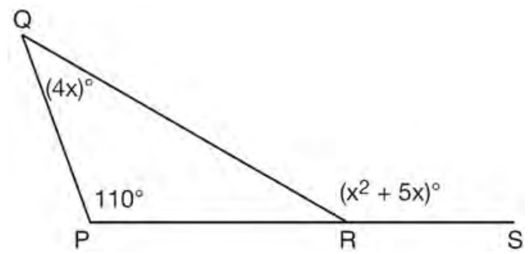
If $m\angle CAB = x + 40$, $m\angle ACB = 3x + 10$, $m\angle CBD = 6x$, what is $m\angle CAB$?
1 13
2 25
3 53
4 65

302 In the diagram below, $\overleftrightarrow{RCBT}$ and $\triangle ABC$ are shown with $m\angle A = 60$ and $m\angle ABT = 125$.



What is $m\angle ACR$?
1 125
2 115
3 65
4 55

303 In the diagram of $\triangle PQR$ shown below, $\overline{PR}$ is extended to S, $m\angle P = 110$, $m\angle Q = 4x$, and $m\angle QRS = x^2 + 5x$.



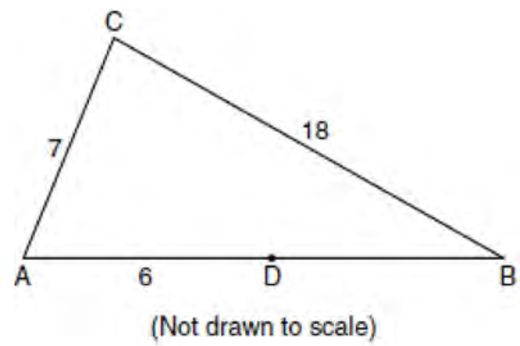
What is $m\angle Q$?
1 44
2 40
3 11
4 10

304 In $\triangle ABC$, an exterior angle at C measures 50º. If $m\angle A > 30$. which inequality must be true?
1 $m\angle B < 20$
2 $m\angle B > 20$
3 $m\angle BCA < 130$
4 $m\angle BCA > 130$

305 In all isosceles triangles, the exterior angle of a base angle must always be
1 a right angle
2 an acute angle
3 an obtuse angle
4 equal to the vertex angle

G.G.33: TRIANGLE INEQUALITY THEOREM

306 In the diagram below of $\triangle ABC$, D is a point on $\overline{AB}$, $AC = 7$, $AD = 6$, and $BC = 18$.



The length of $\overline{DB}$ could be
1 5
2 12
3 19
4 25

307 Which set of numbers represents the lengths of the sides of a triangle?
1 $\{5, 18, 13\}$
2 $\{6, 17, 22\}$
3 $\{16, 24, 7\}$
4 $\{26, 8, 15\}$

308 If two sides of a triangle have lengths of $\frac{1}{4}$ and $\frac{1}{5}$, which fraction can *not* be the length of the third side?
1 $\frac{1}{9}$
2 $\frac{1}{8}$
3 $\frac{1}{3}$
4 $\frac{1}{2}$

309 In $\triangle ABC$, $AB = 5$ feet and $BC = 3$ feet. Which inequality represents all possible values for the length of $\overline{AC}$, in feet?
1 $2 \le AC \le 8$
2 $2 < AC < 8$
3 $3 \le AC \le 7$
4 $3 < AC < 7$

310 Which numbers could represent the lengths of the sides of a triangle?
1 5, 9, 14
2 7, 7, 15
3 1, 2, 4
4 3, 6, 8

311 If two sides of a triangle have lengths of 4 and 10, the third side could be
1 8
2 2
3 16
4 4

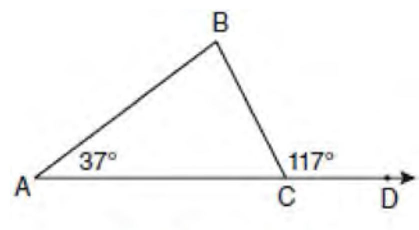
312 The lengths of two sides of a triangle are 7 and 11. Which inequality represents all possible values for x, the length of the third side of the triangle?
1 $4 \le x \le 18$
2 $4 < x \le 18$
3 $4 \le x < 18$
4 $4 < x < 18$

313 Which set of numbers could be the lengths of the sides of an isosceles triangle?
1 $\{1,1,2\}$
2 $\{3,3,5\}$
3 $\{3,4,5\}$
4 $\{4,4,9\}$

G.G.34: ANGLE SIDE RELATIONSHIP

314 In $\triangle ABC$, $m\angle A = 95$, $m\angle B = 50$, and $m\angle C = 35$. Which expression correctly relates the lengths of the sides of this triangle?
1 $AB < BC < CA$
2 $AB < AC < BC$
3 $AC < BC < AB$
4 $BC < AC < AB$

315 In the diagram below of $\triangle ABC$ with side $\overline{AC}$ extended through D, $m\angle A = 37$ and $m\angle BCD = 117$. Which side of $\triangle ABC$ is the longest side? Justify your answer.



(Not drawn to scale)

316 In $\triangle PQR$, $PQ = 8$, $QR = 12$, and $RP = 13$. Which statement about the angles of $\triangle PQR$ must be true?
1 $m\angle Q > m\angle P > m\angle R$
2 $m\angle Q > m\angle R > m\angle P$
3 $m\angle R > m\angle P > m\angle Q$
4 $m\angle P > m\angle R > m\angle Q$

317 In $\triangle ABC$, $AB = 7$, $BC = 8$, and $AC = 9$. Which list has the angles of $\triangle ABC$ in order from smallest to largest?
1 $\angle A, \angle B, \angle C$
2 $\angle B, \angle A, \angle C$
3 $\angle C, \angle B, \angle A$
4 $\angle C, \angle A, \angle B$

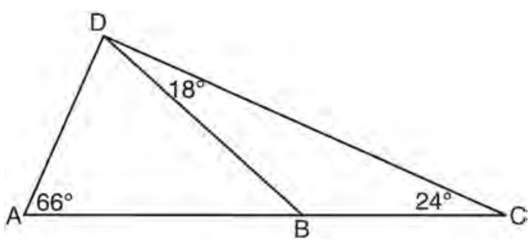
318 In scalene triangle ABC, $m\angle B = 45$ and $m\angle C = 55$. What is the order of the sides in length, from longest to shortest?

1 $\overline{AB}$, $\overline{BC}$, $\overline{AC}$
2 $\overline{BC}$, $\overline{AC}$, $\overline{AB}$
3 $\overline{AC}$, $\overline{BC}$, $\overline{AB}$
4 $\overline{BC}$, $\overline{AB}$, $\overline{AC}$

319 In $\triangle RST$, $m\angle R = 58$ and $m\angle S = 73$. Which inequality is true?

1 $RT < TS < RS$
2 $RS < RT < TS$
3 $RT < RS < TS$
4 $RS < TS < RT$

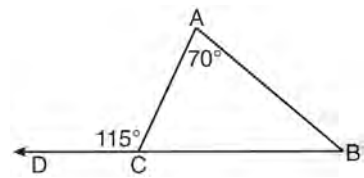
320 As shown in the diagram of $\triangle ACD$ below, B is a point on $\overline{AC}$ and $\overline{DB}$ is drawn.



If $m\angle A = 66$, $m\angle CDB = 18$, and $m\angle C = 24$, what is the longest side of $\triangle ABD$?

1 $\overline{AB}$
2 $\overline{DC}$
3 $\overline{AD}$
4 $\overline{BD}$

321 As shown in the diagram below of $\triangle ABC$, $\overline{BC}$ is extended through D, $m\angle A = 70$, and $m\angle ACD = 115$.



Which statement is true?

1 $AC > AB$
2 $AB > BC$
3 $BC < AC$
4 $AC < AB$

322 In $\triangle ABC$, $m\angle A = x^2 + 12$, $m\angle B = 11x + 5$, and $m\angle C = 13x - 17$. Determine the longest side of $\triangle ABC$.

323 In $\triangle ABC$, $m\angle A = 60$, $m\angle B = 80$, and $m\angle C = 40$. Which inequality is true?

1 $AB > BC$
2 $AC > BC$
3 $AC < BA$
4 $BC < BA$

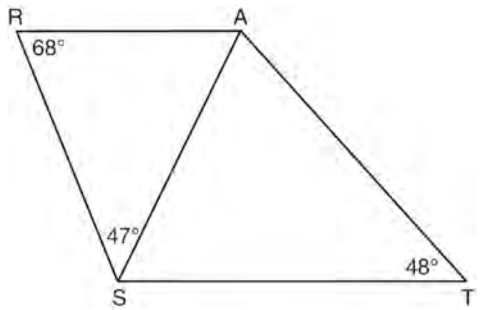
324 In $\triangle ABC$, $\angle A \cong \angle B$ and $\angle C$ is an obtuse angle. Which statement is true?

1 $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the longest side.
2 $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the longest side.
3 $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the shortest side.
4 $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the shortest side.

325 For which measures of the sides of $\triangle ABC$ is angle B the largest angle of the triangle?

1 $AB = 2$, $BC = 6$, $AC = 7$
2 $AB = 6$, $BC = 12$, $AC = 8$
3 $AB = 16$, $BC = 9$, $AC = 10$
4 $AB = 18$, $BC = 14$, $AC = 5$

326 As shown in the diagram below, $\overline{AS}$ is a diagonal of trapezoid $STAR$, $\overline{RA} \parallel \overline{ST}$, $m\angle ATS = 48$, $m\angle RSA = 47$, and $m\angle ARS = 68$.



Determine and state the longest side of $\triangle SAT$.

327 In $\triangle CAT$, $m\angle C = 65$, $m\angle A = 40$, and B is a point on side $\overline{CA}$, such that $\overline{TB} \perp \overline{CA}$. Which line segment is shortest?
1 $\overline{CT}$
2 $\overline{BC}$
3 $\overline{TB}$
4 $\overline{AT}$

328 In $\triangle ABC$, $AB = 4$, $BC = 7$, and $AC = 10$. Which statement is true?
1 $m\angle B > m\angle C > m\angle A$
2 $m\angle B > m\angle A > m\angle C$
3 $m\angle C > m\angle B > m\angle A$
4 $m\angle C > m\angle A > m\angle B$

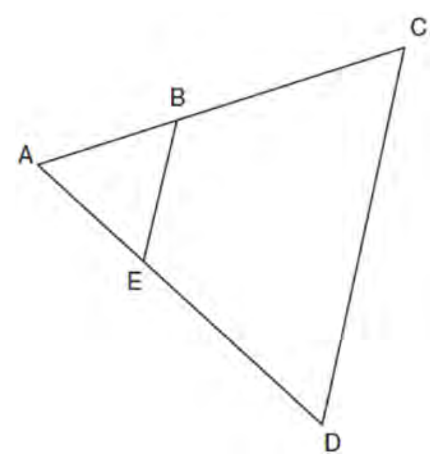
329 In $\triangle ABC$, $m\angle A = 65$ and $m\angle B$ is greater than $m\angle A$. The lengths of the sides of $\triangle ABC$ in order from smallest to largest are
1 $\overline{AB}, \overline{BC}, \overline{AC}$
2 $\overline{BC}, \overline{AB}, \overline{AC}$
3 $\overline{AC}, \overline{BC}, \overline{AB}$
4 $\overline{AB}, \overline{AC}, \overline{BC}$

330 In $\triangle ABC$, $m\angle B < m\angle A < m\angle C$. Which statement is *false*?
1 $AC > BC$
2 $BC > AC$
3 $AC < AB$
4 $BC < AB$

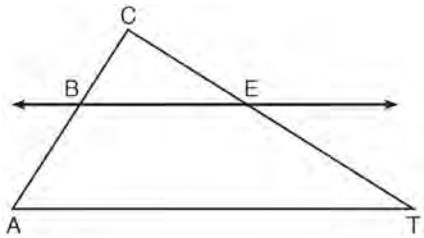
G.G.46: SIDE SPLITTER THEOREM

331 In $\triangle ABC$, point D is on $\overline{AB}$, and point E is on $\overline{BC}$ such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of $\overline{AC}$?
1 8
2 9
3 10.5
4 13.5

332 In the diagram below of $\triangle ACD$, E is a point on $\overline{AD}$ and B is a point on $\overline{AC}$, such that $\overline{EB} \parallel \overline{DC}$. If $AE = 3$, $ED = 6$, and $DC = 15$, find the length of $\overline{EB}$.



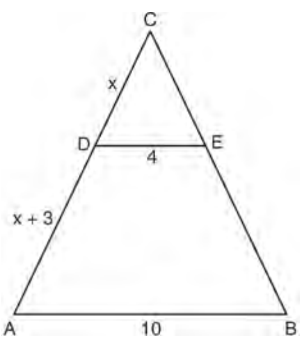
333 In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overline{AT}$.



If $CB = 3$, $CA = 10$, and $CE = 6$, what is the length of $\overline{ET}$?

1 5
2 14
3 20
4 26

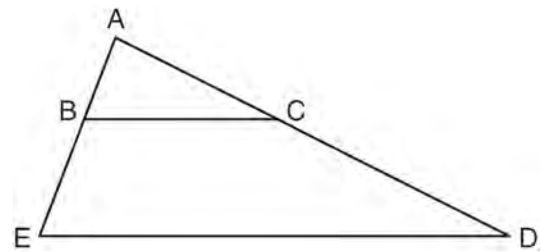
334 In the diagram below of $\triangle ABC$, $\overline{CDA}$, $\overline{CEB}$, $\overline{DE} \parallel \overline{AB}$, $DE = 4$, $AB = 10$, $CD = x$, and $DA = x + 3$.



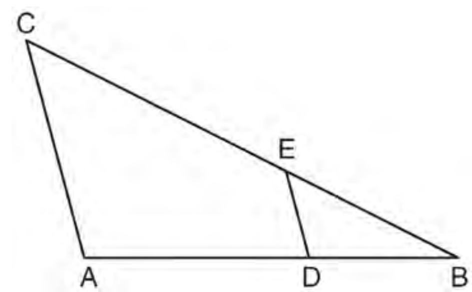
What is the value of x?

1 0.5
2 2
3 5.5
4 6

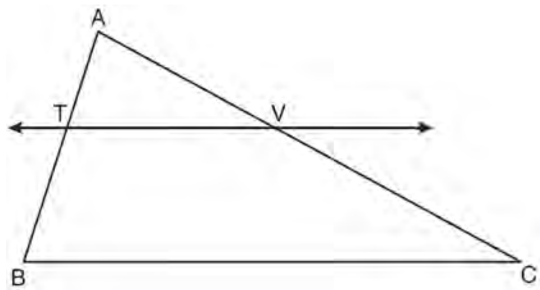
335 In the diagram below of $\triangle ADE$, B is a point on $\overline{AE}$ and C is a point on $\overline{AD}$ such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length of $\overline{AC}$.



336 In the diagram below of $\triangle ABC$, D is a point on $\overline{AB}$, E is a point on $\overline{BC}$, $\overline{AC} \parallel \overline{DE}$, $CE = 25$ inches, $AD = 18$ inches, and $DB = 12$ inches. Find, to the *nearest tenth of an inch*, the length of $\overline{EB}$.

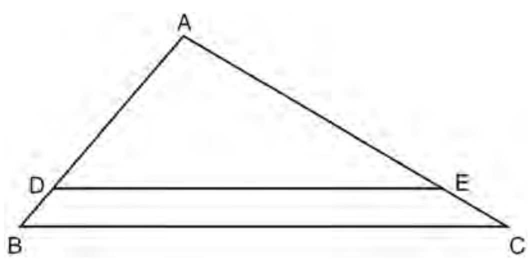


337 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.



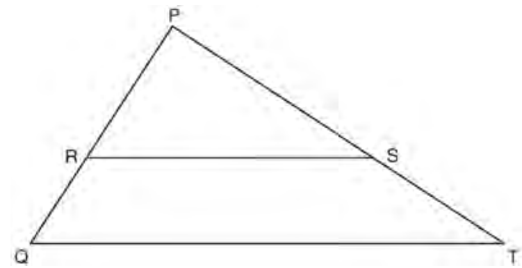
What is the length of $\overline{VC}$?
1 $3\frac{1}{2}$
2 $7\frac{1}{7}$
3 14
4 24

338 In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.



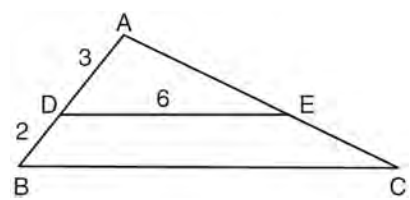
If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?
1 6
2 2
3 3
4 15

339 Triangle PQT with $\overline{RS} \parallel \overline{QT}$ is shown below.



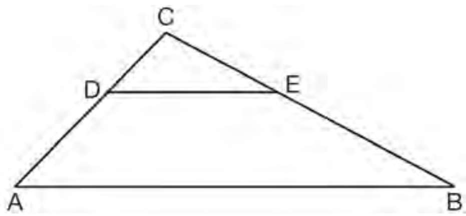
If $PR = 12$, $RQ = 8$, and $PS = 21$, what is the length of $\overline{PT}$?
1 14
2 17
3 35
4 38

340 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{BC}$, $AD = 3$, $DB = 2$, and $DE = 6$.



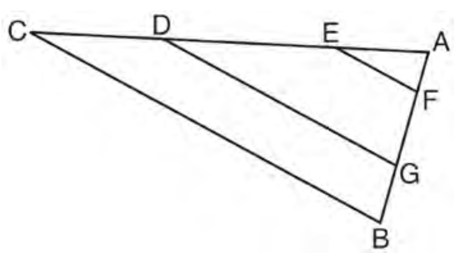
What is the length of $\overline{BC}$?
1 12
2 10
3 8
4 4

341 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{AB}$.



If $CD = 4$, $CA = 10$, $CE = x + 2$, and $EB = 4x - 7$, what is the length of $\overline{CE}$?
1 10
2 8
3 6
4 4

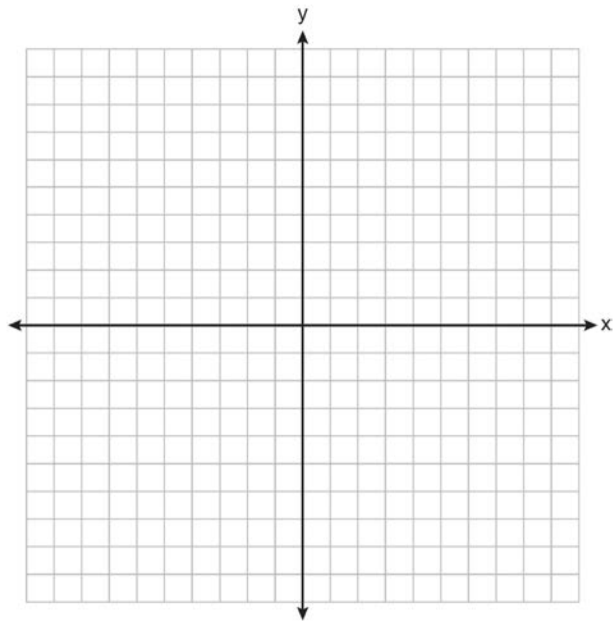
342 In the diagram below of $\triangle ABC$, with $\overline{CDEA}$ and $\overline{BGFA}$, $\overline{EF} \parallel \overline{DG} \parallel \overline{CB}$.



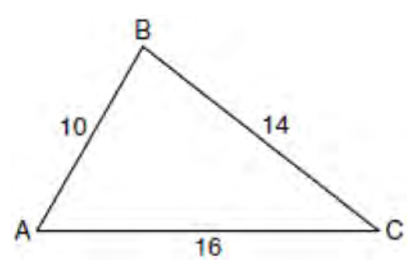
Which statement is *false*?
1 $\frac{AC}{AD} = \frac{AB}{AG}$
2 $\frac{AE}{AF} = \frac{AC}{AB}$
3 $\frac{AE}{AD} = \frac{EC}{AC}$
4 $\frac{BG}{BA} = \frac{CD}{CA}$

G.G.42: MIDSEGMENTS

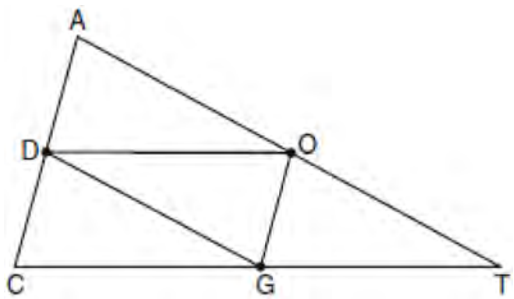
343 On the set of axes below, graph and label $\triangle DEF$ with vertices at $D(-4,-4)$, $E(-2,2)$, and $F(8,-2)$. If G is the midpoint of $\overline{EF}$ and H is the midpoint of $\overline{DF}$, state the coordinates of G and H and label each point on your graph. Explain why $\overline{GH} \parallel \overline{DE}$.



344 In the diagram of $\triangle ABC$ below, $AB = 10$, $BC = 14$, and $AC = 16$. Find the perimeter of the triangle formed by connecting the midpoints of the sides of $\triangle ABC$.

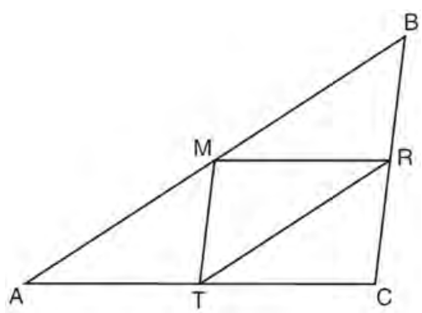


345 In the diagram below of $\triangle ACT$, D is the midpoint of $\overline{AC}$, O is the midpoint of $\overline{AT}$, and G is the midpoint of $\overline{CT}$.



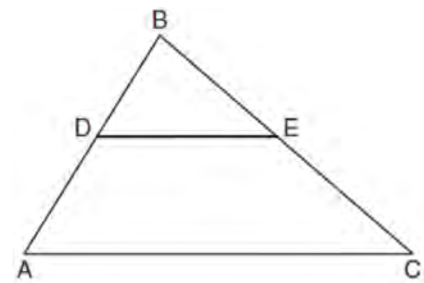
If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?
1 21
2 25
3 32
4 40

346 As shown in the diagram below, M, R, and T are midpoints of the sides of $\triangle ABC$.

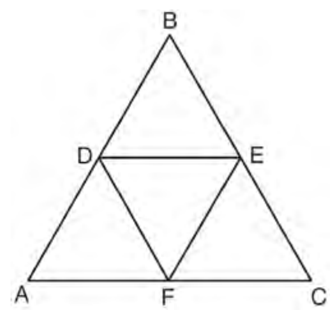


If $AB = 18$, $AC = 14$, and $BC = 10$, what is the perimeter of quadrilateral $ACRM$?
1 35
2 32
3 24
4 21

347 In the diagram below of $\triangle ABC$, $\overline{DE}$ is a midsegment of $\triangle ABC$, $DE = 7$, $AB = 10$, and $BC = 13$. Find the perimeter of $\triangle ABC$.

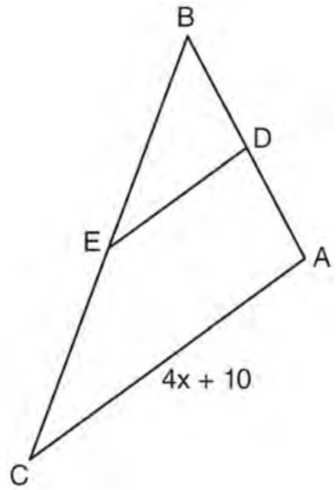


348 In the diagram below, the vertices of $\triangle DEF$ are the midpoints of the sides of equilateral triangle ABC, and the perimeter of $\triangle ABC$ is 36 cm.



What is the length, in centimeters, of $\overline{EF}$?
1 6
2 12
3 18
4 4

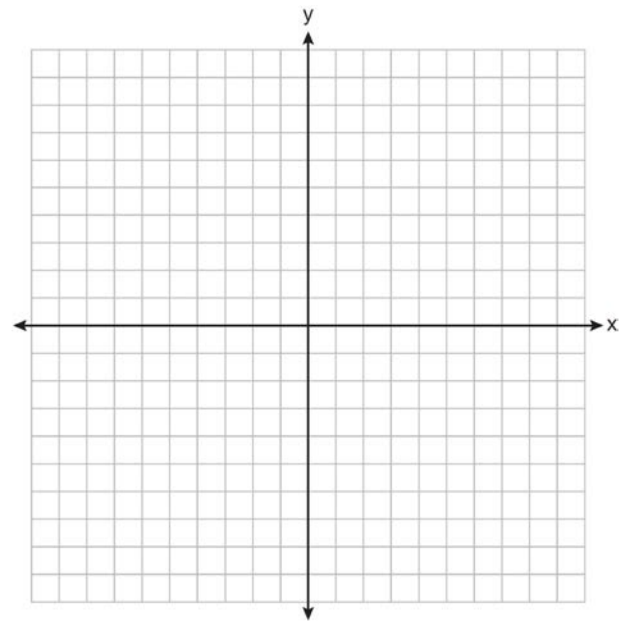
349 In the diagram below of $\triangle ABC$, D is the midpoint of $\overline{AB}$, and E is the midpoint of $\overline{BC}$.



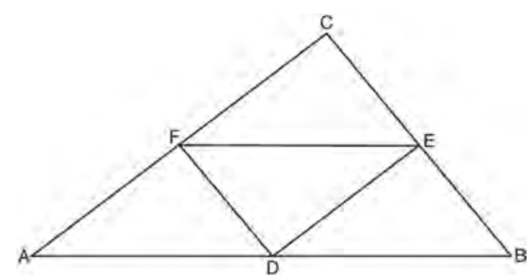
If $AC = 4x + 10$, which expression represents DE?

1 $x + 2.5$
2 $2x + 5$
3 $2x + 10$
4 $8x + 20$

350 Triangle HKL has vertices $H(-7,2)$, $K(3,-4)$, and $L(5,4)$. The midpoint of $\overline{HL}$ is M and the midpoint of $\overline{LK}$ is N. Determine and state the coordinates of points M and N. Justify the statement: $\overline{MN}$ is parallel to $\overline{HK}$. [The use of the set of axes below is optional.]



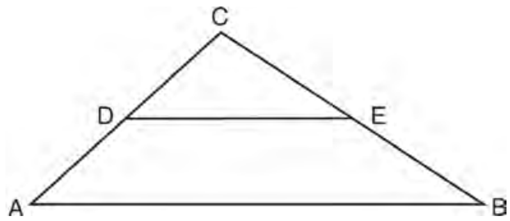
351 In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$.



If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?

1 24
2 36
3 40
4 44

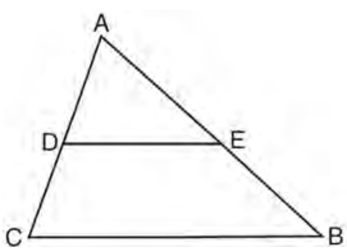
352 In the diagram below, $\overline{DE}$ joins the midpoints of two sides of $\triangle ABC$.



Which statement is *not* true?

1 $CE = \frac{1}{2}CB$
2 $DE = \frac{1}{2}AB$
3 area of $\triangle CDE = \frac{1}{2}$ area of $\triangle CAB$
4 perimeter of $\triangle CDE = \frac{1}{2}$ perimeter of $\triangle CAB$

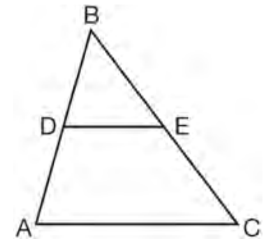
353 Triangle *ABC* is shown in the diagram below.



If $\overline{DE}$ joins the midpoints of $\overline{ADC}$ and $\overline{AEB}$, which statement is *not* true?

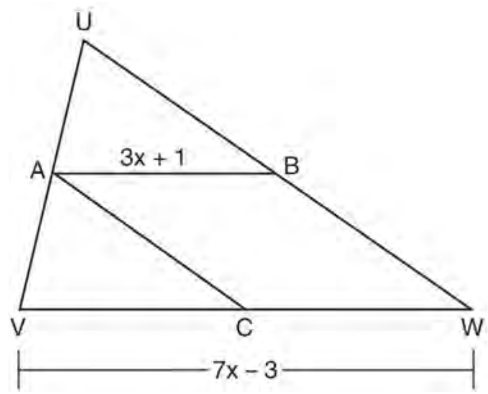
1 $DE = \frac{1}{2}CB$
2 $\overline{DE} \parallel \overline{CB}$
3 $\frac{AD}{DC} = \frac{DE}{CB}$
4 $\triangle ABC \sim \triangle AED$

354 In $\triangle ABC$, *D* is the midpoint of $\overline{AB}$ and *E* is the midpoint of $\overline{BC}$. If $AC = 3x - 15$ and $DE = 6$, what is the value of *x*?



1 6
2 7
3 9
4 12

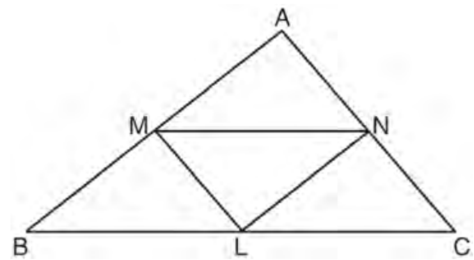
355 In the diagram of $\triangle UVW$ below, *A* is the midpoint of $\overline{UV}$, *B* is the midpoint of $\overline{UW}$, *C* is the midpoint of $\overline{VW}$, and $\overline{AB}$ and $\overline{AC}$ are drawn.



If $VW = 7x - 3$ and $AB = 3x + 1$, what is the length of $\overline{VC}$?

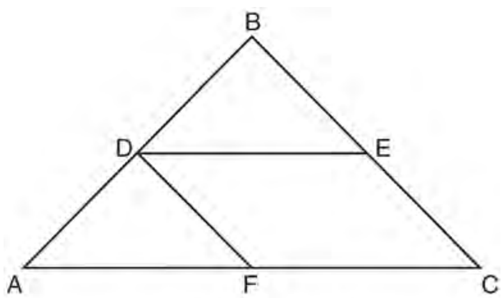
1 5
2 13
3 16
4 32

356 In $\triangle ABC$ shown below, L is the midpoint of $\overline{BC}$, M is the midpoint of $\overline{AB}$, and N is the midpoint of $\overline{AC}$.



If $MN = 8$, $ML = 5$, and $NL = 6$, the perimeter of trapezoid $BMNC$ is
1 35
2 31
3 28
4 26

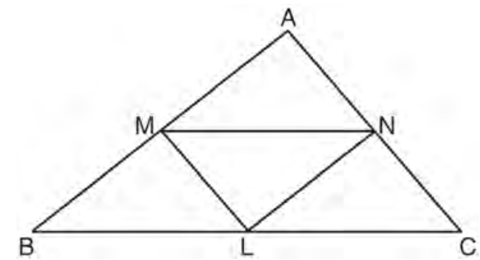
357 In the diagram below of $\triangle ABC$, $\overline{DE}$ and $\overline{DF}$ are midsegments.



(Not drawn to scale)

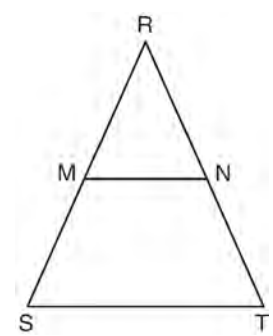
If $DE = 9$, and $BC = 17$, determine and state the perimeter of quadrilateral $FDEC$.

358 In $\triangle ABC$ shown below, L is the midpoint of $\overline{BC}$, M is the midpoint of $\overline{AB}$, and N is the midpoint of $\overline{AC}$.



If $MN = 8$, $ML = 5$, and $NL = 6$, the perimeter of trapezoid $BMNC$ is
1 26
2 28
3 30
4 35

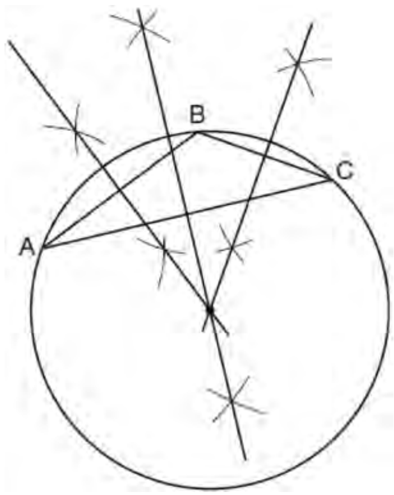
359 In isosceles triangle RST shown below, $\overline{RS} \cong \overline{RT}$, M and N are midpoints of $\overline{RS}$ and $\overline{RT}$, respectively, and $\overline{MN}$ is drawn. If $MN = 3.5$ and the perimeter of $\triangle RST$ is 25, determine and state the length of $\overline{NT}$.



G.G.21: CENTROID, ORTHOCENTER, INCENTER AND CIRCUMCENTER

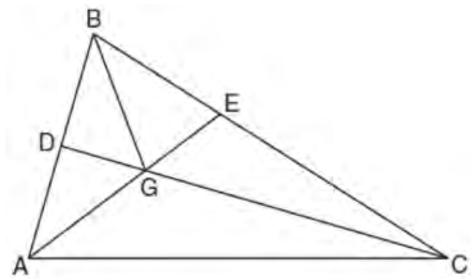
360 In which triangle do the three altitudes intersect outside the triangle?
1 a right triangle
2 an acute triangle
3 an obtuse triangle
4 an equilateral triangle

361 The diagram below shows the construction of the center of the circle circumscribed about $\triangle ABC$.



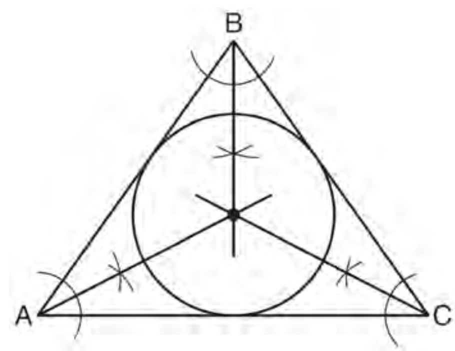
This construction represents how to find the intersection of
1 the angle bisectors of $\triangle ABC$
2 the medians to the sides of $\triangle ABC$
3 the altitudes to the sides of $\triangle ABC$
4 the perpendicular bisectors of the sides of $\triangle ABC$

362 In the diagram below of $\triangle ABC$, $\overline{CD}$ is the bisector of $\angle BCA$, $\overline{AE}$ is the bisector of $\angle CAB$, and $\overline{BG}$ is drawn.



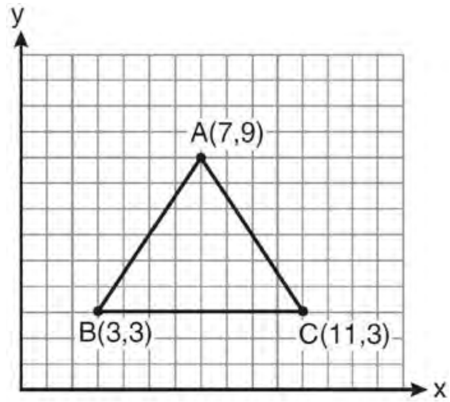
Which statement must be true?
1 $DG = EG$
2 $AG = BG$
3 $\angle AEB \cong \angle AEC$
4 $\angle DBG \cong \angle EBG$

363 Which geometric principle is used in the construction shown below?



1 The intersection of the angle bisectors of a triangle is the center of the inscribed circle.
2 The intersection of the angle bisectors of a triangle is the center of the circumscribed circle.
3 The intersection of the perpendicular bisectors of the sides of a triangle is the center of the inscribed circle.
4 The intersection of the perpendicular bisectors of the sides of a triangle is the center of the circumscribed circle.

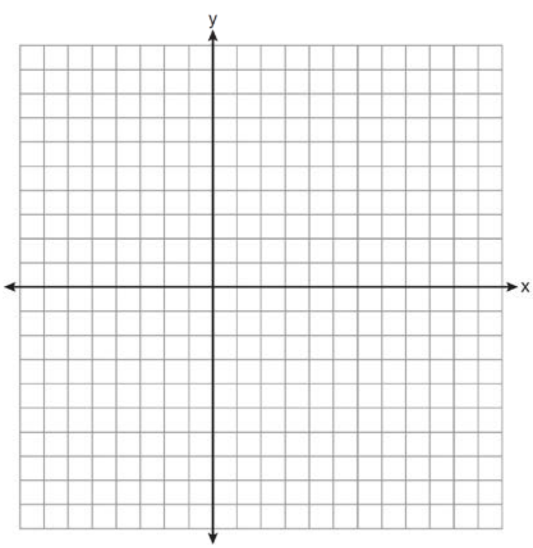
364 The vertices of the triangle in the diagram below are $A(7,9)$, $B(3,3)$, and $C(11,3)$.



What are the coordinates of the centroid of $\triangle ABC$?

1 (5,6)
2 (7,3)
3 (7,5)
4 (9,6)

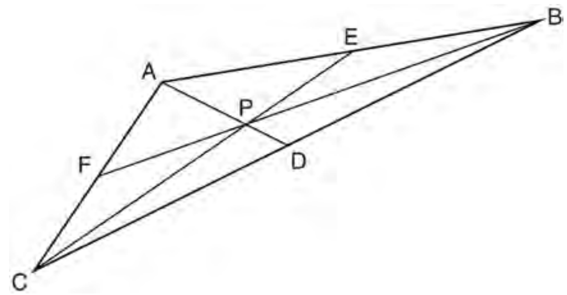
365 Triangle ABC has vertices $A(3,3)$, $B(7,9)$, and $C(11,3)$. Determine the point of intersection of the medians, and state its coordinates. [The use of the set of axes below is optional.]



366 In a given triangle, the point of intersection of the three medians is the same as the point of intersection of the three altitudes. Which classification of the triangle is correct?

1 scalene triangle
2 isosceles triangle
3 equilateral triangle
4 right isosceles triangle

367 In the diagram below of $\triangle ABC$, $\overline{AE} \cong \overline{BE}$, $\overline{AF} \cong \overline{CF}$, and $\overline{CD} \cong \overline{BD}$.



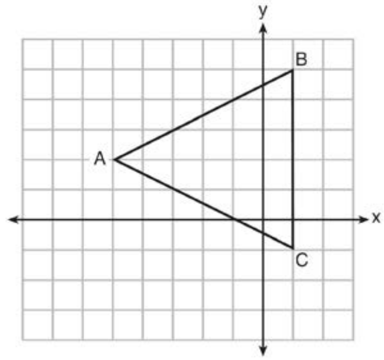
Point P must be the

1 centroid
2 circumcenter
3 Incenter
4 orthocenter

368 For a triangle, which two points of concurrence could be located outside the triangle?

1 incenter and centroid
2 centroid and orthocenter
3 incenter and circumcenter
4 circumcenter and orthocenter

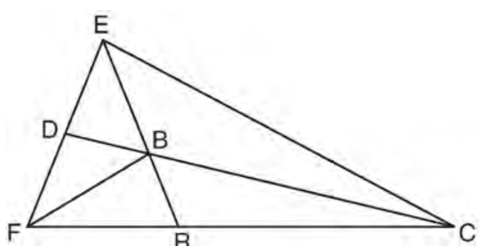
369 Triangle ABC is graphed on the set of axes below.



What are the coordinates of the point of intersection of the medians of $\triangle ABC$?

1 $(-1,2)$
2 $(-3,2)$
3 $(0,2)$
4 $(1,2)$

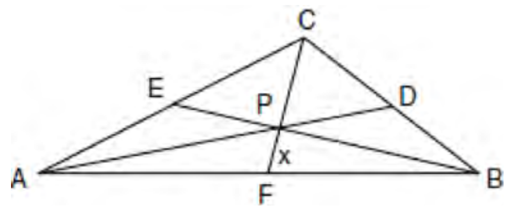
370 In the diagram below, point B is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



If $m\angle FEC = 84$ and $m\angle ECF = 28$, determine and state $m\angle BRC$.

G.G.43: CENTROID

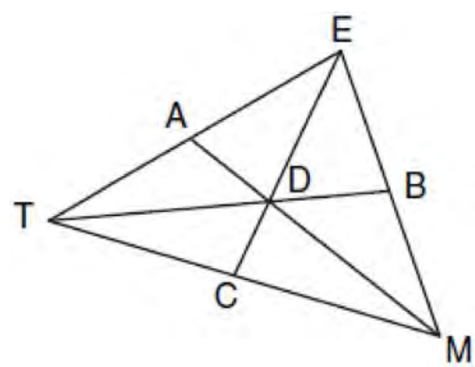
371 In the diagram of $\triangle ABC$ below, Jose found centroid P by constructing the three medians. He measured $\overline{CF}$ and found it to be 6 inches.



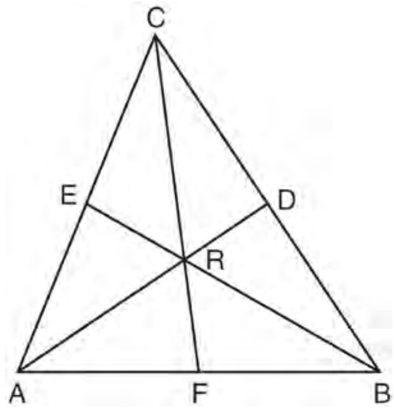
If $PF = x$, which equation can be used to find x?

1 $x + x = 6$
2 $2x + x = 6$
3 $3x + 2x = 6$
4 $x + \frac{2}{3}x = 6$

372 In the diagram below of $\triangle TEM$, medians $\overline{TB}$, $\overline{EC}$, and $\overline{MA}$ intersect at D, and $TB = 9$. Find the length of $\overline{TD}$.

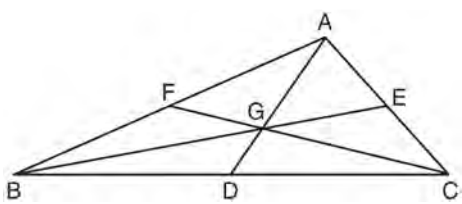


373 In $\triangle ABC$ shown below, medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ intersect at point R.



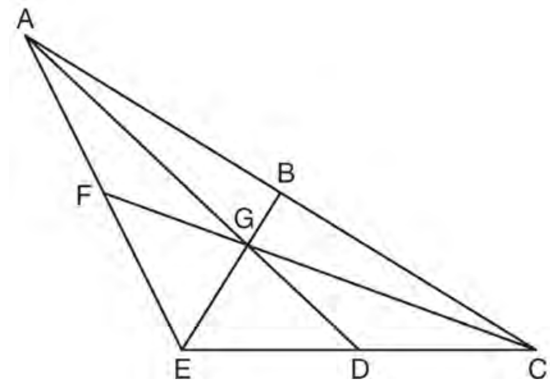
If $CR = 24$ and $RF = 2x - 6$, what is the value of x?
1 9
2 12
3 15
4 27

374 In the diagram below of $\triangle ABC$, medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ intersect at G.



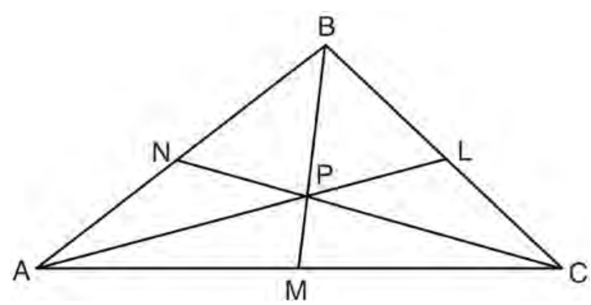
If $CF = 24$, what is the length of $\overline{FG}$?
1 8
2 10
3 12
4 16

375 In the diagram below of $\triangle ACE$, medians $\overline{AD}$, $\overline{EB}$, and $\overline{CF}$ intersect at G. The length of $\overline{FG}$ is 12 cm.



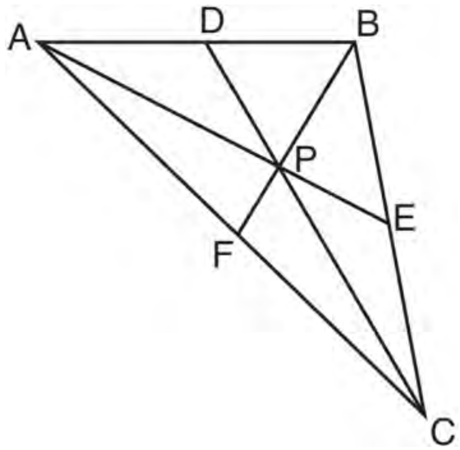
What is the length, in centimeters, of $\overline{GC}$?
1 24
2 12
3 6
4 4

376 In the diagram below, point P is the centroid of $\triangle ABC$.



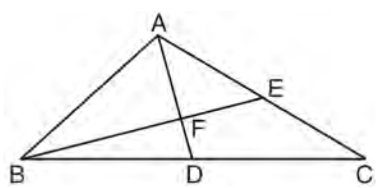
If $PM = 2x + 5$ and $BP = 7x + 4$, what is the length of $\overline{PM}$?
1 9
2 2
3 18
4 27

377 In $\triangle ABC$ shown below, P is the centroid and $BF = 18$.



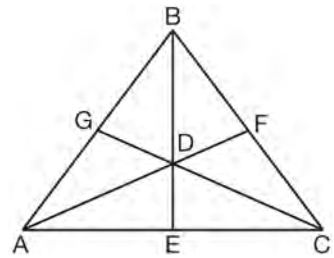
What is the length of $\overline{BP}$?
1 6
2 9
3 3
4 12

378 In the diagram of $\triangle ABC$ below, medians $\overline{AD}$ and $\overline{BE}$ intersect at point F.



If $AF = 6$, what is the length of $\overline{FD}$?
1 6
2 2
3 3
4 9

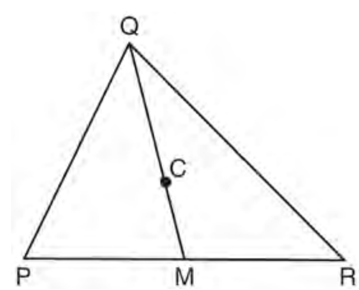
379 As shown below, the medians of $\triangle ABC$ intersect at D.



If the length of $\overline{BE}$ is 12, what is the length of $\overline{BD}$?
1 8
2 9
3 3
4 4

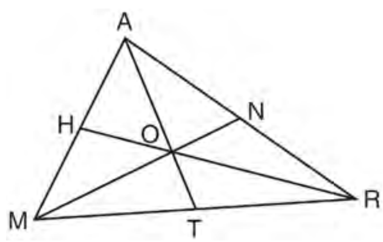
380 The three medians of a triangle intersect at a point. Which measurements could represent the segments of one of the medians?
1 2 and 3
2 3 and 4.5
3 3 and 6
4 3 and 9

381 In the diagram below, $\overline{QM}$ is a median of triangle PQR and point C is the centroid of triangle PQR.



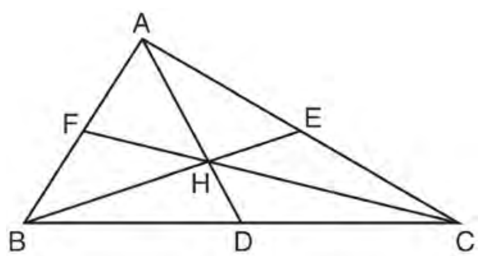
If $QC = 5x$ and $CM = x + 12$, determine and state the length of $\overline{QM}$.

382 In the diagram below of $\triangle MAR$, medians $\overline{MN}$, $\overline{AT}$, and $\overline{RH}$ intersect at O.



If $TO = 10$, what is the length of $\overline{TA}$?
1 30
2 25
3 20
4 15

383 In the diagram below of $\triangle ABC$, point H is the intersection of the three medians.

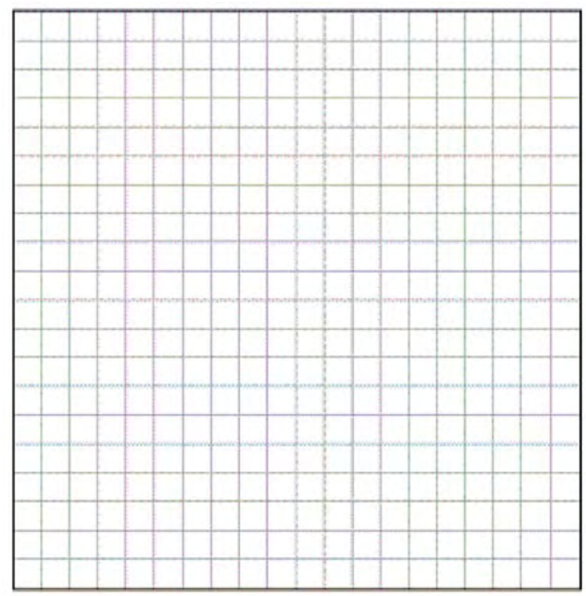


If $\overline{DH}$ measures 2.4 centimeters, what is the length, in centimeters, of $\overline{AD}$?
1 3.6
2 4.8
3 7.2
4 9.6

G.G.69: TRIANGLES IN THE COORDINATE PLANE

384 The vertices of $\triangle ABC$ are $A(-1,-2)$, $B(-1,2)$ and $C(6,0)$. Which conclusion can be made about the angles of $\triangle ABC$?
1 $m\angle A = m\angle B$
2 $m\angle A = m\angle C$
3 $m\angle ACB = 90$
4 $m\angle ABC = 60$

385 Triangle ABC has coordinates $A(-6,2)$, $B(-3,6)$, and $C(5,0)$. Find the perimeter of the triangle. Express your answer in simplest radical form. [The use of the grid below is optional.]

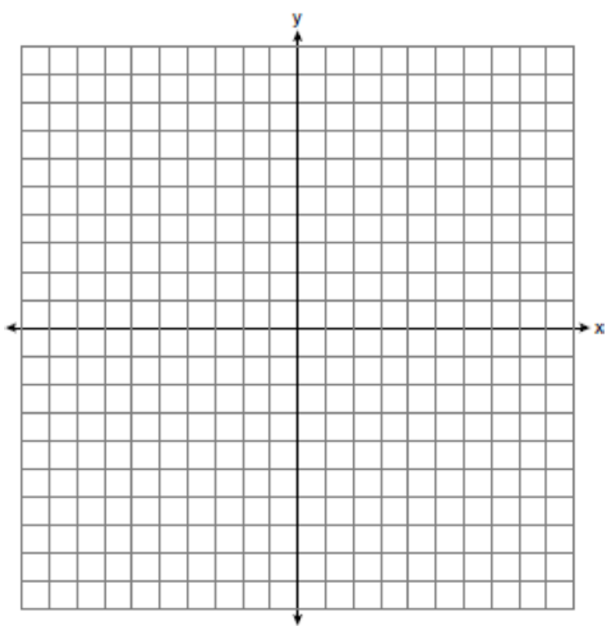


386 Triangle ABC has vertices $A(0,0)$, $B(3,2)$, and $C(0,4)$. The triangle may be classified as
1 equilateral
2 isosceles
3 right
4 scalene

387 Which type of triangle can be drawn using the points $(-2,3)$, $(-2,-7)$, and $(4,-5)$?
1 scalene
2 isosceles
3 equilateral
4 no triangle can be drawn

388 If the vertices of $\triangle ABC$ are $A(-2,4)$, $B(-2,8)$, and $C(-5,6)$, then $\triangle ABC$ is classified as
1 right
2 scalene
3 isosceles
4 equilateral

389 Given: Triangle RST has coordinates $R(-1,7)$, $S(3,-1)$, and $T(9,2)$
Prove: $\triangle RST$ is a right triangle
[The use of the set of axes below is optional.]

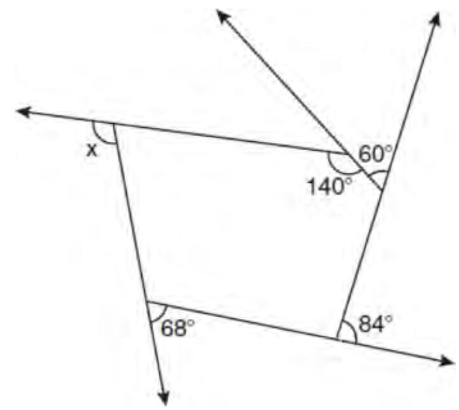


390 Triangle ABC has vertices at $A(3,0)$, $B(9,-5)$, and $C(7,-8)$. Find the length of $\overline{AC}$ in simplest radical form.

POLYGONS

G.G.36: INTERIOR AND EXTERIOR ANGLES OF POLYGONS

391 The pentagon in the diagram below is formed by five rays.



What is the degree measure of angle x?
1 72
2 96
3 108
4 112

392 In which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
1 triangle
2 hexagon
3 octagon
4 quadrilateral

393 The number of degrees in the sum of the interior angles of a pentagon is
1 72
2 360
3 540
4 720

394 If the sum of the interior angles of a polygon is 1440°, then the polygon must be
1 an octagon
2 a decagon
3 a hexagon
4 a nonagon

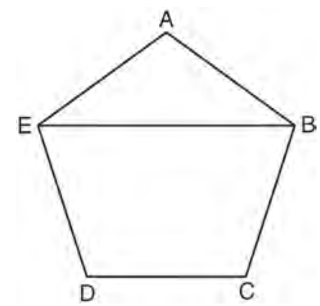
395 The sum of the interior angles of a polygon of n sides is
1 360
2 $\frac{360}{n}$
3 $(n-2)\cdot 180$
4 $\frac{(n-2)\cdot 180}{n}$

396 For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
1 hexagon
2 pentagon
3 quadrilateral
4 triangle

G.G.37: INTERIOR AND EXTERIOR ANGLES OF POLYGONS

397 What is the measure of an interior angle of a regular octagon?
1 45º
2 60º
3 120º
4 135º

398 In the diagram below of regular pentagon *ABCDE*, $\overline{EB}$ is drawn.



What is the measure of $\angle AEB$?
1 36º
2 54º
3 72º
4 108º

399 Find, in degrees, the measures of both an interior angle and an exterior angle of a regular pentagon.

400 What is the measure of each interior angle of a regular hexagon?
1 60°
2 120°
3 135°
4 270°

401 The measure of an interior angle of a regular polygon is 120°. How many sides does the polygon have?
1 5
2 6
3 3
4 4

402 Determine, in degrees, the measure of each interior angle of a regular octagon.

403 What is the difference between the sum of the measures of the interior angles of a regular pentagon and the sum of the measures of the exterior angles of a regular pentagon?
1 36
2 72
3 108
4 180

404 What is the measure of the largest exterior angle that any regular polygon can have?
1 60º
2 90º
3 120º
4 360º

405 A regular polygon has an exterior angle that measures 45°. How many sides does the polygon have?
1 10
2 8
3 6
4 4

406 The sum of the interior angles of a regular polygon is 540°. Determine and state the number of degrees in one interior angle of the polygon.

407 Determine and state the measure, in degrees, of an interior angle of a regular decagon.

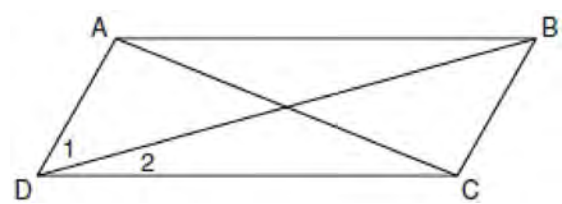
408 A regular polygon with an exterior angle of 40° is a
1 pentagon
2 hexagon
3 nonagon
4 decagon

409 The sum of the interior angles of a regular polygon is 720°. How many sides does the polygon have?
1 8
2 6
3 5
4 4

410 What is the measure of each interior angle in a regular octagon?
1 108º
2 135º
3 144º
4 1080º

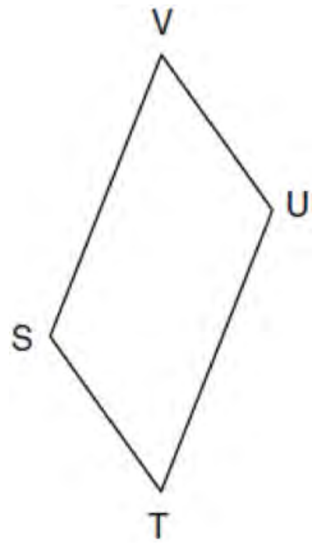
G.G.38: PARALLELOGRAMS

411 In the diagram below of parallelogram *ABCD* with diagonals $\overline{AC}$ and $\overline{BD}$, $m\angle 1 = 45$ and $m\angle DCB = 120$.



What is the measure of $\angle 2$?
1 15º
2 30º
3 45º
4 60º

412 In the diagram below of parallelogram $STUV$, $SV = x + 3$, $VU = 2x - 1$, and $TU = 4x - 3$.

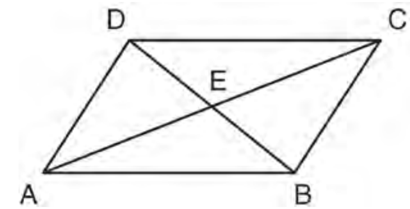


What is the length of $\overline{SV}$?
1 5
2 2
3 7
4 4

413 In parallelogram $RSTU$, $m\angle R = 5x - 2$ and $m\angle S = 3x + 10$. Determine and state the value of x.

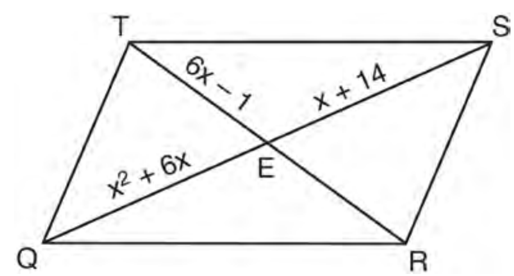
414 Which statement is true about every parallelogram?
1 All four sides are congruent.
2 The interior angles are all congruent.
3 Two pairs of opposite sides are congruent.
4 The diagonals are perpendicular to each other.

415 In the diagram below, parallelogram $ABCD$ has diagonals $\overline{AC}$ and $\overline{BD}$ that intersect at point E.



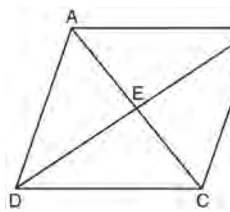
Which expression is *not* always true?
1 $\angle DAE \cong \angle BCE$
2 $\angle DEC \cong \angle BEA$
3 $\overline{AC} \cong \overline{DB}$
4 $\overline{DE} \cong \overline{EB}$

416 As shown in the diagram below, the diagonals of parallelogram $QRST$ intersect at E. If $QE = x^2 + 6x$, $SE = x + 14$, and $TE = 6x - 1$, determine TE algebraically.



417 In parallelogram $QRST$, diagonal $\overline{QS}$ is drawn. Which statement must always be true?
1 $\triangle QRS$ is an isosceles triangle.
2 $\triangle STQ$ is an acute triangle.
3 $\triangle STQ \cong \triangle QRS$
4 $\overline{QS} \cong \overline{QT}$

418 Parallelogram $ABCD$ with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at E is shown below.



Which statement must be true?

1 $\overline{BE} \cong \overline{CE}$
2 $\angle BAE \cong \angle DCE$
3 $\overline{AB} \cong \overline{BC}$
4 $\angle DAE \cong \angle CBE$

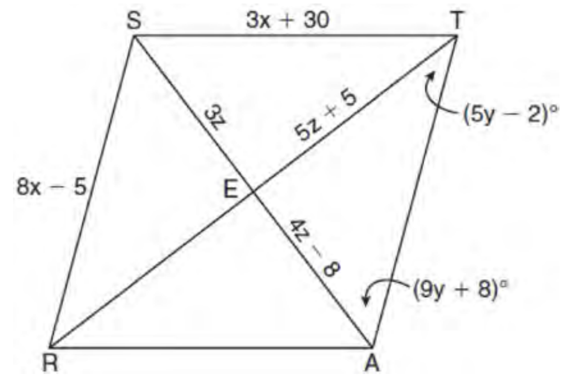
419 In parallelogram $ABCD$, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.

420 In parallelogram $JKLM$, $m\angle L$ exceeds $m\angle M$ by 30 degrees. What is the measure of $m\angle J$?

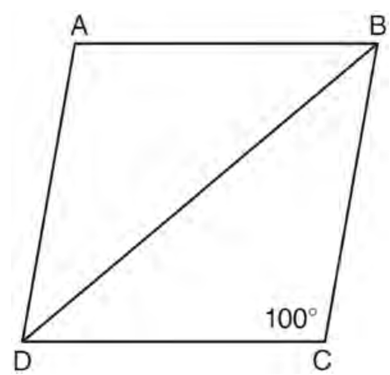
1 75°
2 105°
3 165°
4 195°

G.G.39: PARALLELOGRAMS

421 In the diagram below, quadrilateral $STAR$ is a rhombus with diagonals $\overline{SA}$ and $\overline{TR}$ intersecting at E. $ST = 3x + 30$, $SR = 8x - 5$, $SE = 3z$, $TE = 5z + 5$, $AE = 4z - 8$, $m\angle RTA = 5y - 2$, and $m\angle TAS = 9y + 8$. Find SR, RT, and $m\angle TAS$.



422 In the diagram below of rhombus $ABCD$, $m\angle C = 100$.



What is $m\angle DBC$?

1 40
2 45
3 50
4 80

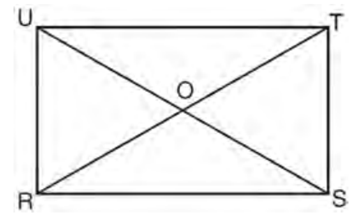
423 In rhombus $ABCD$, the diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E. If $AE = 5$ and $BE = 12$, what is the length of $\overline{AB}$?
1 7
2 10
3 13
4 17

424 Which quadrilateral has diagonals that always bisect its angles and also bisect each other?
1 rhombus
2 rectangle
3 parallelogram
4 isosceles trapezoid

425 The diagonals of a quadrilateral are congruent but do not bisect each other. This quadrilateral is
1 an isosceles trapezoid
2 a parallelogram
3 a rectangle
4 a rhombus

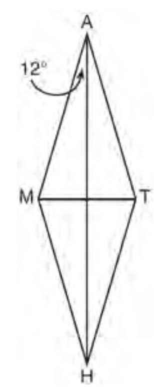
426 Given three distinct quadrilaterals, a square, a rectangle, and a rhombus, which quadrilaterals must have perpendicular diagonals?
1 the rhombus, only
2 the rectangle and the square
3 the rhombus and the square
4 the rectangle, the rhombus, and the square

427 In the diagram below of rectangle $RSTU$, diagonals $\overline{RT}$ and $\overline{SU}$ intersect at O.



If $RT = 6x + 4$ and $SO = 7x - 6$, what is the length of $\overline{US}$?
1 8
2 2
3 16
4 32

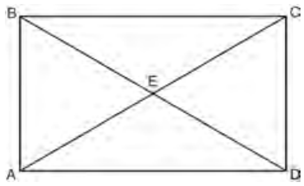
428 In the diagram below, $MATH$ is a rhombus with diagonals $\overline{AH}$ and $\overline{MT}$.



If $m\angle HAM = 12$, what is $m\angle AMT$?
1 12
2 78
3 84
4 156

429 Which reason could be used to prove that a parallelogram is a rhombus?
1 Diagonals are congruent.
2 Opposite sides are parallel.
3 Diagonals are perpendicular.
4 Opposite angles are congruent.

430 As shown in the diagram of rectangle $ABCD$ below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



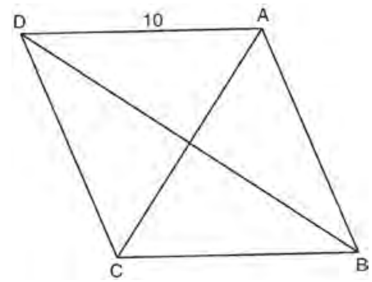
If $AE = x + 2$ and $BD = 4x - 16$, then the length of $\overline{AC}$ is
1 6
2 10
3 12
4 24

431 What is the perimeter of a rhombus whose diagonals are 16 and 30?
1 92
2 68
3 60
4 17

432 What is the perimeter of a square whose diagonal is $3\sqrt{2}$?
1 18
2 12
3 9
4 6

433 Which quadrilateral does *not* always have congruent diagonals?
1 isosceles trapezoid
2 rectangle
3 rhombus
4 square

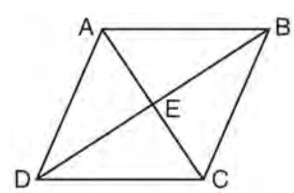
434 In rhombus $ABCD$, with diagonals $\overline{AC}$ and $\overline{DB}$, $AD = 10$.



If the length of diagonal $\overline{AC}$ is 12, what is the length of $\overline{DB}$?
1 8
2 16
3 $\sqrt{44}$
4 $\sqrt{136}$

435 In quadrilateral $ABCD$, the diagonals bisect its angles. If the diagonals are *not* congruent, quadrilateral $ABCD$ must be a
1 square
2 rectangle
3 rhombus
4 trapezoid

436 In the diagram below of rhombus $ABCD$, the diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



If $AC = 18$ and $BD = 24$, what is the length of one side of rhombus $ABCD$?
1 15
2 18
3 24
4 30

437 In quadrilateral *ABCD*, each diagonal bisects opposite angles. If $m\angle DAB = 70$, then *ABCD* must be a

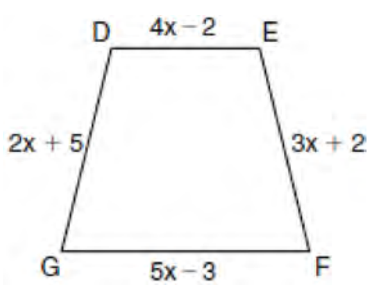
1 rectangle
2 trapezoid
3 rhombus
4 square

G.G.40: TRAPEZOIDS

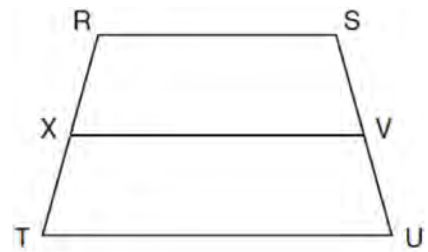
438 Isosceles trapezoid *ABCD* has diagonals $\overline{AC}$ and $\overline{BD}$. If $AC = 5x + 13$ and $BD = 11x - 5$, what is the value of *x*?

1 28
2 $10\frac{3}{4}$
3 3
4 $\frac{1}{2}$

439 In the diagram below of isosceles trapezoid *DEFG*, $\overline{DE} \parallel \overline{GF}$, $DE = 4x - 2$, $EF = 3x + 2$, $FG = 5x - 3$, and $GD = 2x + 5$. Find the value of *x*.



440 In the diagram below of trapezoid *RSUT*, $\overline{RS} \parallel \overline{TU}$, *X* is the midpoint of $\overline{RT}$, and *V* is the midpoint of $\overline{SU}$.



If $RS = 30$ and $XV = 44$, what is the length of $\overline{TU}$?

1 37
2 58
3 74
4 118

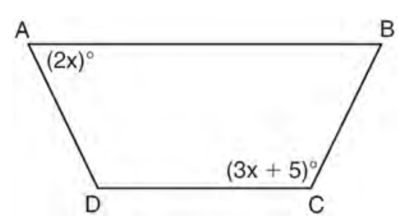
441 If the diagonals of a quadrilateral do *not* bisect each other, then the quadrilateral could be a

1 rectangle
2 rhombus
3 square
4 trapezoid

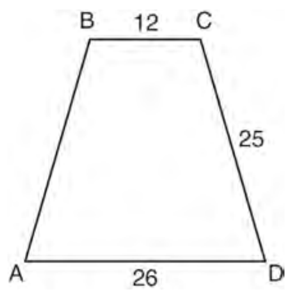
442 In isosceles trapezoid *ABCD*, $\overline{AB} \cong \overline{CD}$. If $BC = 20$, $AD = 36$, and $AB = 17$, what is the length of the altitude of the trapezoid?

1 10
2 12
3 15
4 16

443 The diagram below shows isosceles trapezoid *ABCD* with $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \cong \overline{BC}$. If $m\angle BAD = 2x$ and $m\angle BCD = 3x + 5$, find $m\angle BAD$.

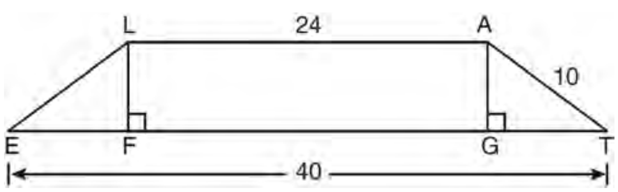


444 In the diagram below of isosceles trapezoid *ABCD*, $AB = CD = 25$, $AD = 26$, and $BC = 12$.



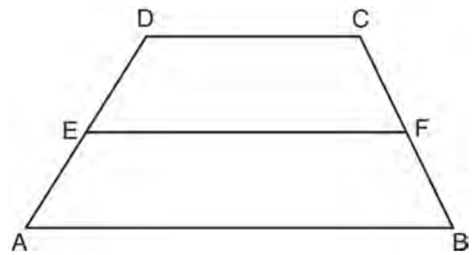
What is the length of an altitude of the trapezoid?
1 7
2 14
3 19
4 24

445 In the diagram below, *LATE* is an isosceles trapezoid with $\overline{LE} \cong \overline{AT}$, $LA = 24$, $ET = 40$, and $AT = 10$. Altitudes $\overline{LF}$ and $\overline{AG}$ are drawn.



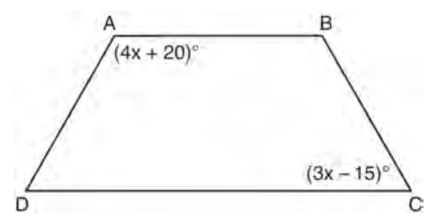
What is the length of $\overline{LF}$?
1 6
2 8
3 3
4 4

446 In the diagram below, $\overline{EF}$ is the median of trapezoid *ABCD*.



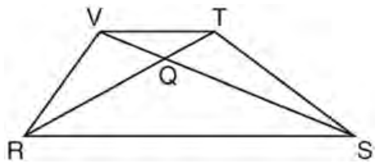
If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of x?
1 5
2 2
3 7
4 8

447 In the diagram of trapezoid *ABCD* below, $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cong \overline{BC}$, $m\angle A = 4x + 20$, and $m\angle C = 3x - 15$.



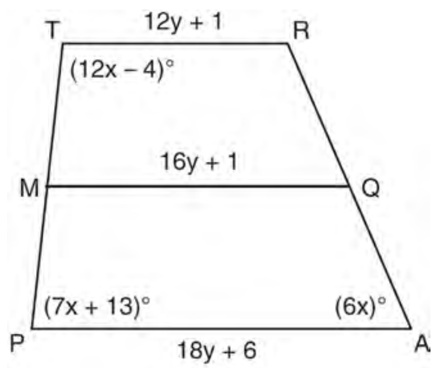
What is $m\angle D$?
1 25
2 35
3 60
4 90

448 In trapezoid *RSTV* with bases $\overline{RS}$ and $\overline{VT}$, diagonals $\overline{RT}$ and $\overline{SV}$ intersect at *Q*.

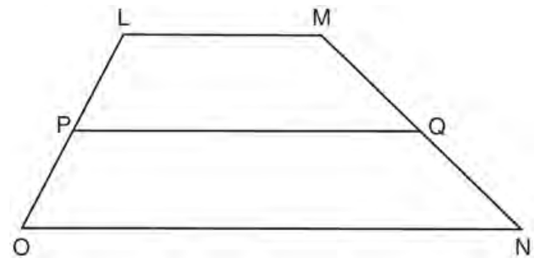


If trapezoid *RSTV* is *not* isosceles, which triangle is equal in area to $\triangle RSV$?
1 $\triangle RQV$
2 $\triangle RST$
3 $\triangle RVT$
4 $\triangle SVT$

449 Trapezoid *TRAP*, with median $\overline{MQ}$, is shown in the diagram below. Solve algebraically for *x* and *y*.



450 In trapezoid *LMNO* below, median $\overline{PQ}$ is drawn.



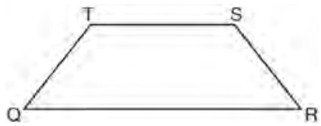
If $LM = x + 7$, $ON = 3x + 11$, and $PQ = 25$, what is the value of *x*?
1 1.75
2 3.5
3 8
4 17

451 In the diagram below, $\overline{AB}$ and $\overline{CD}$ are bases of trapezoid *ABCD*.

(Not drawn to scale)

If $m\angle B = 123$ and $m\angle D = 75$, what is $m\angle C$?
1 57
2 75
3 105
4 123

452 In isosceles trapezoid $QRST$ shown below, $\overline{QR}$ and $\overline{TS}$ are bases.



If $m\angle Q = 5x + 3$ and $m\angle R = 7x - 15$, what is $m\angle Q$?
1 83
2 48
3 16
4 9

G.G.41: SPECIAL QUADRILATERALS

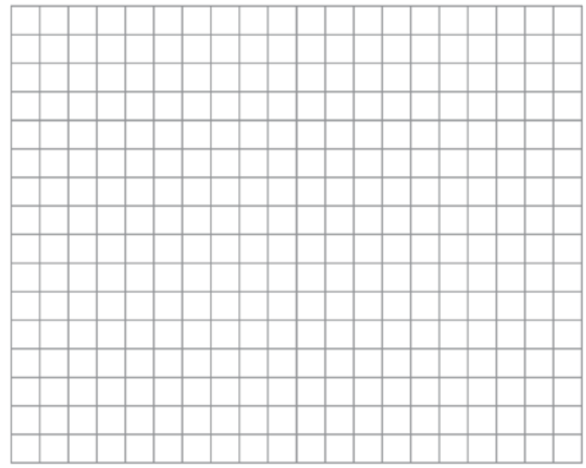
453 A quadrilateral whose diagonals bisect each other and are perpendicular is a
1 rhombus
2 rectangle
3 trapezoid
4 parallelogram

454 Which quadrilateral has diagonals that are always perpendicular bisectors of each other?
1 square
2 rectangle
3 trapezoid
4 parallelogram

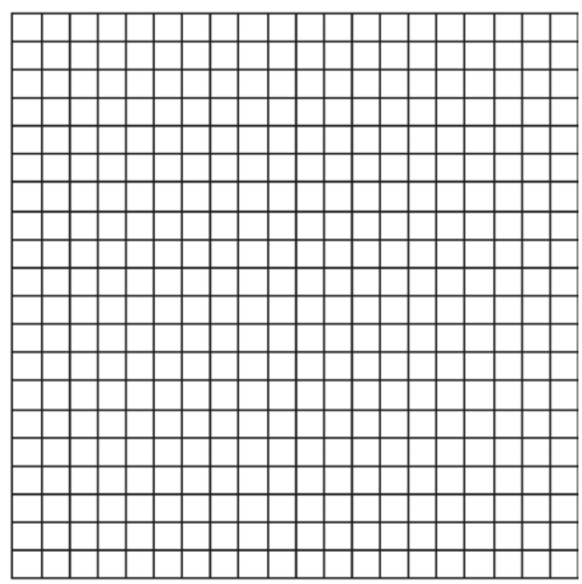
G.G.69: QUADRILATERALS IN THE COORDINATE PLANE

455 The coordinates of the vertices of parallelogram $ABCD$ are $A(-3,2)$, $B(-2,-1)$, $C(4,1)$, and $D(3,4)$. The slopes of which line segments could be calculated to show that $ABCD$ is a rectangle?
1 $\overline{AB}$ and $\overline{DC}$
2 $\overline{AB}$ and $\overline{BC}$
3 $\overline{AD}$ and $\overline{BC}$
4 $\overline{AC}$ and $\overline{BD}$

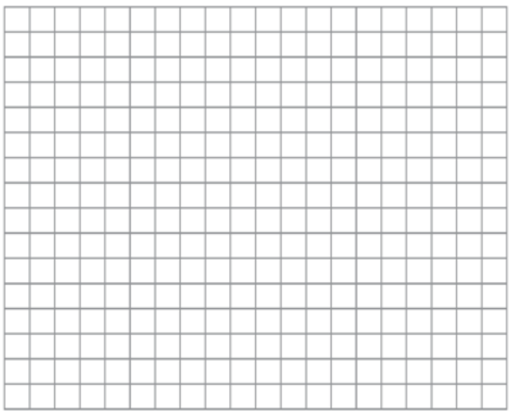
456 Given: Quadrilateral $ABCD$ has vertices $A(-5,6)$, $B(6,6)$, $C(8,-3)$, and $D(-3,-3)$.
Prove: Quadrilateral $ABCD$ is a parallelogram but is neither a rhombus nor a rectangle. [The use of the grid below is optional.]



457 Quadrilateral $MATH$ has coordinates $M(1,1)$, $A(-2,5)$, $T(3,5)$, and $H(6,1)$. Prove that quadrilateral $MATH$ is a rhombus and prove that it is *not* a square. [The use of the grid is optional.]



458 Given: $\triangle ABC$ with vertices $A(-6,-2)$, $B(2,8)$, and $C(6,-2)$. $\overline{AB}$ has midpoint D, $\overline{BC}$ has midpoint E, and $\overline{AC}$ has midpoint F.
Prove: *ADEF* is a parallelogram
ADEF is *not* a rhombus
[The use of the grid is optional.]

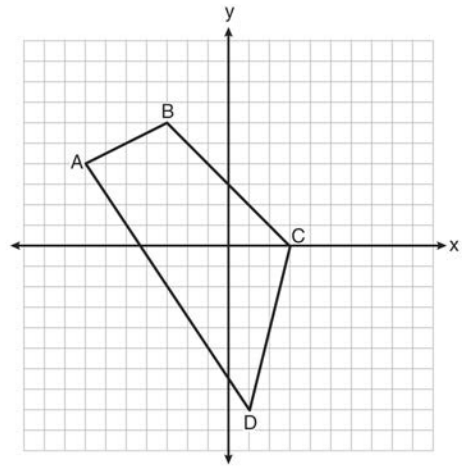


459 Parallelogram *ABCD* has coordinates $A(1,5)$, $B(6,3)$, $C(3,-1)$, and $D(-2,1)$. What are the coordinates of *E*, the intersection of diagonals $\overline{AC}$ and $\overline{BD}$?
1 $(2,2)$
2 $(4.5,1)$
3 $(3.5,2)$
4 $(-1,3)$

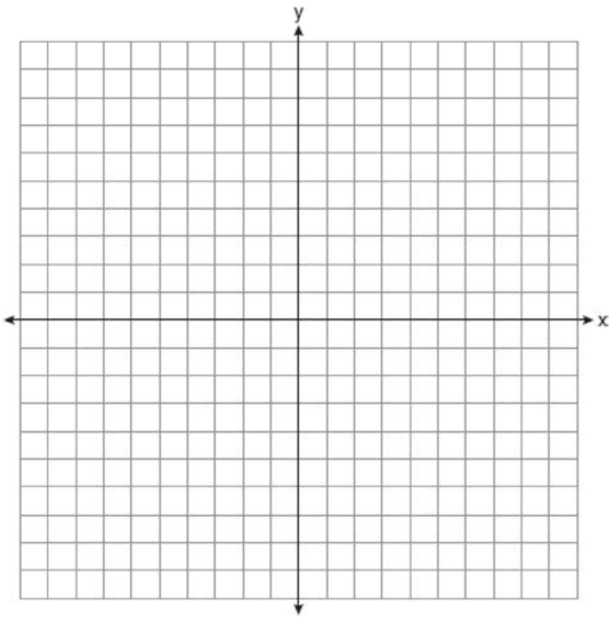
460 Square *ABCD* has vertices $A(-2,-3)$, $B(4,-1)$, $C(2,5)$, and $D(-4,3)$. What is the length of a side of the square?
1 $2\sqrt{5}$
2 $2\sqrt{10}$
3 $4\sqrt{5}$
4 $10\sqrt{2}$

461 The coordinates of two vertices of square *ABCD* are $A(2,1)$ and $B(4,4)$. Determine the slope of side $\overline{BC}$.

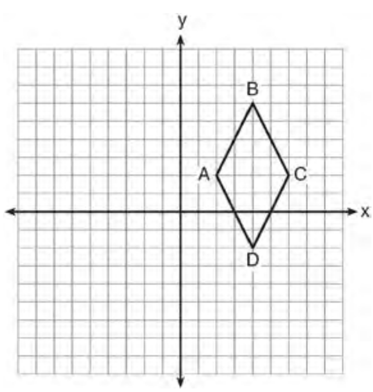
462 Quadrilateral *ABCD* with vertices $A(-7,4)$, $B(-3,6)$, $C(3,0)$, and $D(1,-8)$ is graphed on the set of axes below. Quadrilateral *MNPQ* is formed by joining *M*, *N*, *P*, and *Q*, the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{AD}$, respectively. Prove that quadrilateral *MNPQ* is a parallelogram. Prove that quadrilateral *MNPQ* is *not* a rhombus.



463 The vertices of quadrilateral $JKLM$ have coordinates $J(-3,1)$, $K(1,-5)$, $L(7,-2)$, and $M(3,4)$. Prove that $JKLM$ is a parallelogram. Prove that $JKLM$ is *not* a rhombus. [The use of the set of axes below is optional.]



464 Quadrilateral $ABCD$ is graphed on the set of axes below.



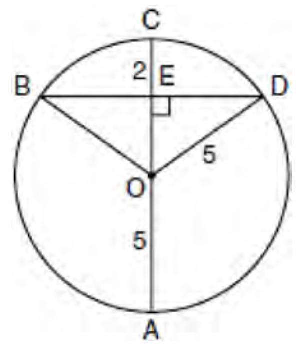
Which quadrilateral best classifies $ABCD$?
1 trapezoid
2 rectangle
3 rhombus
4 square

465 Rectangle $KLMN$ has vertices $K(0,4)$, $L(4,2)$, $M(1,-4)$, and $N(-3,-2)$. Determine and state the coordinates of the point of intersection of the diagonals.

CONICS

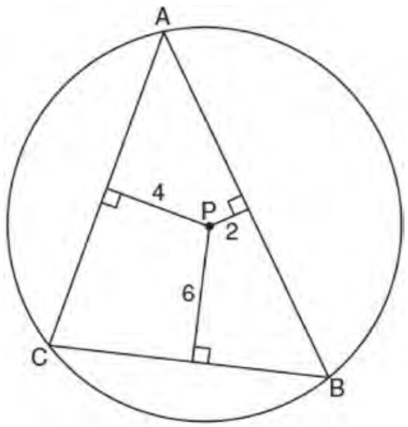
G.G.49: CHORDS

466 In the diagram below, circle O has a radius of 5, and $CE = 2$. Diameter $\overline{AC}$ is perpendicular to chord $\overline{BD}$ at E.



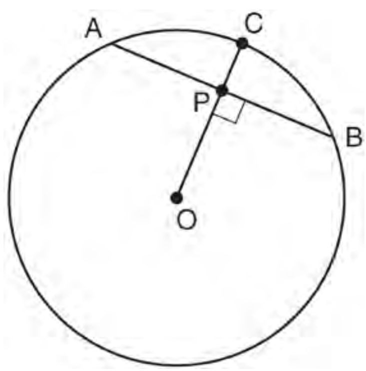
What is the length of $\overline{BD}$?
1 12
2 10
3 8
4 4

467 In the diagram below, $\triangle ABC$ is inscribed in circle P. The distances from the center of circle P to each side of the triangle are shown.



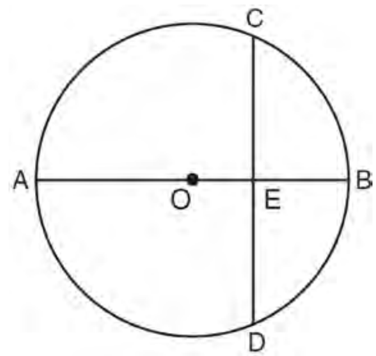
Which statement about the sides of the triangle is true?
1 $AB > AC > BC$
2 $AB < AC$ and $AC > BC$
3 $AC > AB > BC$
4 $AC = AB$ and $AB > BC$

468 In the diagram below of circle O, radius $\overline{OC}$ is 5 cm. Chord $\overline{AB}$ is 8 cm and is perpendicular to $\overline{OC}$ at point P.



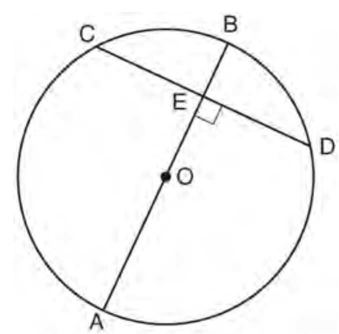
What is the length of $\overline{OP}$, in centimeters?
1 8
2 2
3 3
4 4

469 In the diagram below of circle O, diameter $\overline{AOB}$ is perpendicular to chord $\overline{CD}$ at point E, $OA = 6$, and $OE = 2$.

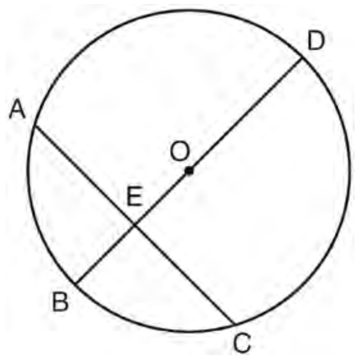


What is the length of $\overline{CE}$?
1 $4\sqrt{3}$
2 $2\sqrt{3}$
3 $8\sqrt{2}$
4 $4\sqrt{2}$

470 In the diagram below of circle O, diameter $\overline{AB}$ is perpendicular to chord $\overline{CD}$ at E. If $AO = 10$ and $BE = 4$, find the length of $\overline{CE}$.

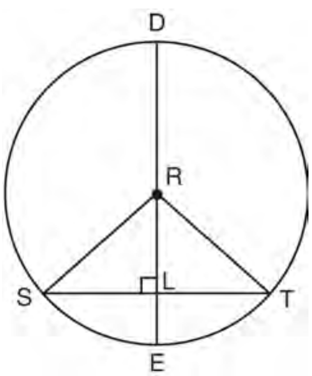


471 In circle O shown below, diameter $\overline{DB}$ is perpendicular to chord $\overline{AC}$ at E.



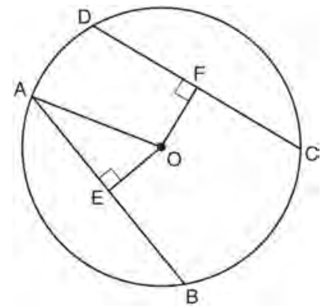
If $DB = 34$, $AC = 30$, and $DE > BE$, what is the length of $\overline{BE}$?
1 8
2 9
3 16
4 25

472 In circle R shown below, diameter $\overline{DE}$ is perpendicular to chord $\overline{ST}$ at point L.



Which statement is *not* always true?
1 $\overline{SL} \cong \overline{TL}$
2 $RS = DR$
3 $\overline{RL} \cong \overline{LE}$
4 $(DL)(LE) = (SL)(LT)$

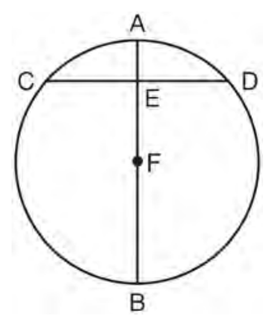
473 In circle O shown below, chords $\overline{AB}$ and $\overline{CD}$ and radius $\overline{OA}$ are drawn, such that $\overline{AB} \cong \overline{CD}$, $\overline{OE} \perp \overline{AB}$, $\overline{OF} \perp \overline{CD}$, $OF = 16$, $CF = y + 10$, and $CD = 4y - 20$.



Determine the length of $\overline{DF}$. Determine the length of $\overline{OA}$.

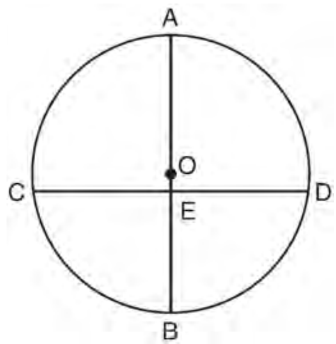
474 In circle O, diameter $\overline{AB}$ intersects chord $\overline{CD}$ at E. If $CE = ED$, then $\angle CEA$ is which type of angle?
1 straight
2 obtuse
3 acute
4 right

475 In the diagram below, diameter $\overline{AB}$ bisects chord $\overline{CD}$ at point E in circle F.



If $AE = 2$ and $FB = 17$, then the length of $\overline{CE}$ is
1 7
2 8
3 15
4 16

476 In the diagram below of circle O, diameter $\overline{AB}$ and chord $\overline{CD}$ intersect at E.

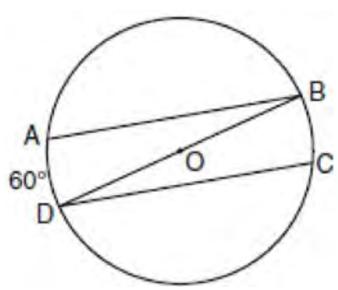


If $\overline{AB} \perp \overline{CD}$, which statement is always true?

1 $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
2 $\overset{\frown}{BD} \cong \overset{\frown}{DA}$
3 $\overset{\frown}{AD} \cong \overset{\frown}{BC}$
4 $\overset{\frown}{CB} \cong \overset{\frown}{BD}$

G.G.52: CHORDS AND SECANTS

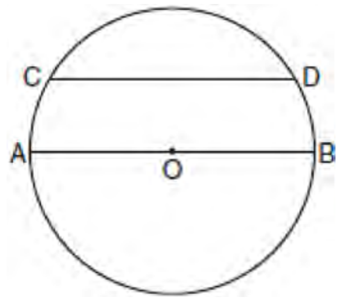
477 In the diagram of circle O below, chords $\overline{AB}$ and $\overline{CD}$ are parallel, and $\overline{BD}$ is a diameter of the circle.



If $m\overset{\frown}{AD} = 60$, what is $m\angle CDB$?

1 20
2 30
3 60
4 120

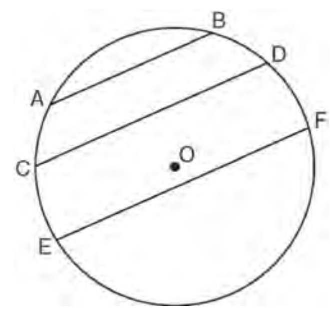
478 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{AC} = 30$.



What is $m\overset{\frown}{CD}$?

1 150
2 120
3 100
4 60

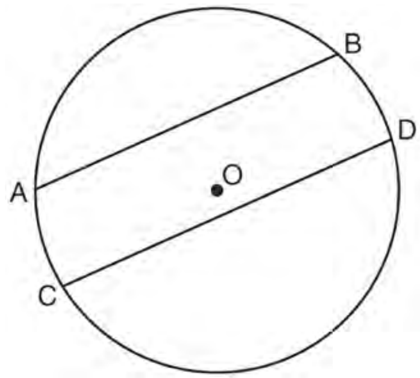
479 In the diagram below of circle O, chord $\overline{AB} \parallel$ chord $\overline{CD}$, and chord $\overline{CD} \parallel$ chord $\overline{EF}$.



Which statement must be true?

1 $\overset{\frown}{CE} \cong \overset{\frown}{DF}$
2 $\overset{\frown}{AC} \cong \overset{\frown}{DF}$
3 $\overset{\frown}{AC} \cong \overset{\frown}{CE}$
4 $\overset{\frown}{EF} \cong \overset{\frown}{CD}$

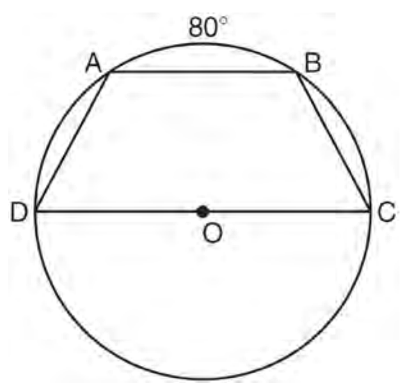
480 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



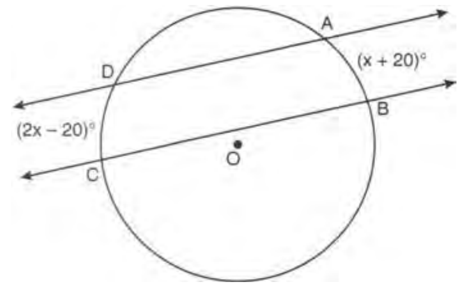
Which statement must be true?

1 $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
2 $\overset{\frown}{AB} \cong \overset{\frown}{CD}$
3 $\overline{AB} \cong \overline{CD}$
4 $\overset{\frown}{ABD} \cong \overset{\frown}{CDB}$

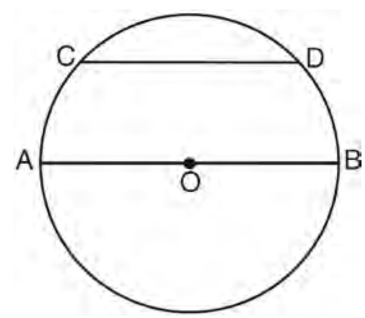
481 In the diagram below, trapezoid $ABCD$, with bases $\overline{AB}$ and $\overline{DC}$, is inscribed in circle O, with diameter $\overline{DC}$. If $m\overset{\frown}{AB}=80$, find $m\overset{\frown}{BC}$.



482 In the diagram below, two parallel lines intersect circle O at points A, B, C, and D, with $m\overset{\frown}{AB} = x + 20$ and $m\overset{\frown}{DC} = 2x - 20$. Find $m\overset{\frown}{AB}$.



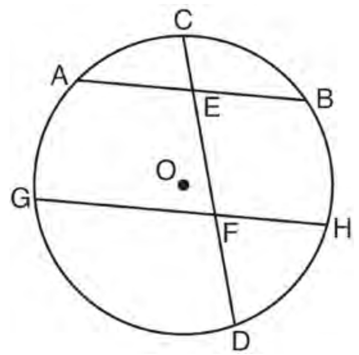
483 In the diagram below of circle O, diameter $\overline{AB}$ is parallel to chord $\overline{CD}$.



If $m\overset{\frown}{CD} = 70$, what is $m\overset{\frown}{AC}$?

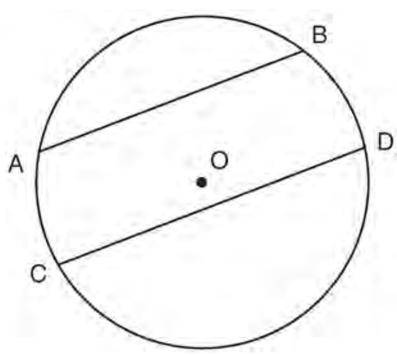
1 110
2 70
3 55
4 35

484 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{GH}$. Chord $\overline{CD}$ intersects $\overline{AB}$ at E and $\overline{GH}$ at F.



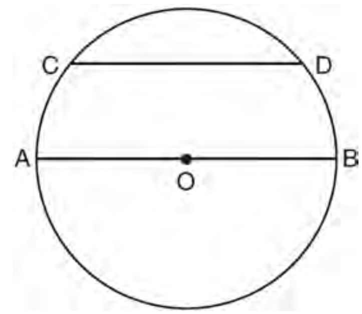
Which statement must always be true?
1 $\overset{\frown}{AC} \cong \overset{\frown}{CB}$
2 $\overset{\frown}{DH} \cong \overset{\frown}{BH}$
3 $\overset{\frown}{AB} \cong \overset{\frown}{GH}$
4 $\overset{\frown}{AG} \cong \overset{\frown}{BH}$

485 In circle O shown in the diagram below, chords $\overline{AB}$ and $\overline{CD}$ are parallel.



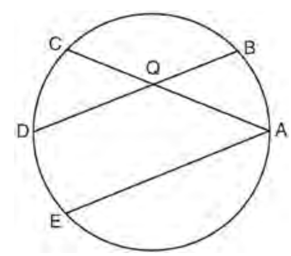
If $m\overset{\frown}{AB} = 104$ and $m\overset{\frown}{CD} = 168$, what is $m\overset{\frown}{BD}$?
1 38
2 44
3 88
4 96

486 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{CD} = 110$.



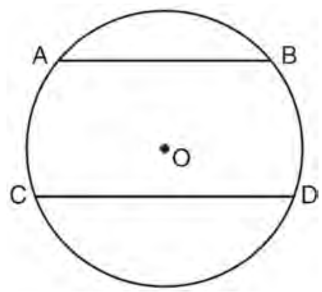
What is $m\overset{\frown}{DB}$?
1 35
2 55
3 70
4 110

487 In the diagram of the circle shown below, chords $\overline{AC}$ and $\overline{BD}$ intersect at Q, and chords $\overline{AE}$ and $\overline{BD}$ are parallel.



Which statement must always be true?
1 $\overset{\frown}{AB} \cong \overset{\frown}{CD}$
2 $\overset{\frown}{DE} \cong \overset{\frown}{CD}$
3 $\overset{\frown}{AB} \cong \overset{\frown}{DE}$
4 $\overset{\frown}{BD} \cong \overset{\frown}{AE}$

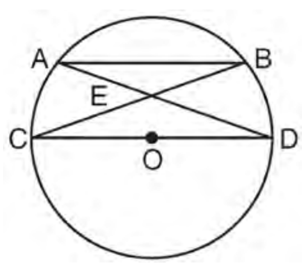
488 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



A correct justification for $m\overset{\frown}{AC} = m\overset{\frown}{BD}$ in circle O is

1 parallel chords intercept congruent arcs
2 congruent chords intercept congruent arcs
3 if two chords are parallel, then they are congruent
4 if two chords are equidistant from the center, then the arcs they intercept are congruent

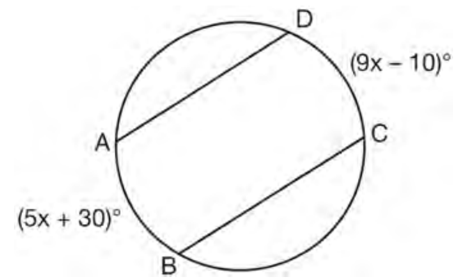
489 In circle O shown below, chord $\overline{AB}$ and diameter $\overline{CD}$ are parallel, and chords $\overline{AD}$ and $\overline{BC}$ intersect at point E.



Which statement is *false*?

1 $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
2 $BE = CE$
3 $\triangle ABE \sim \triangle CDE$
4 $\angle B \cong \angle C$

490 In the diagram of the circle below, $\overline{AD} \parallel \overline{BC}$, $\overset{\frown}{AB} = (5x+30)°$, and $\overset{\frown}{CD} = (9x-10)°$.



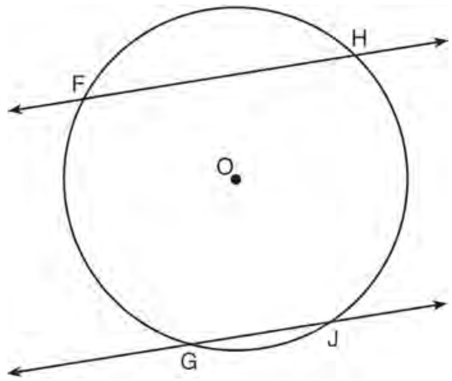
What is $m\overset{\frown}{AB}$?

1 5
2 10
3 55
4 80

491 Points A, B, C, and D are located on circle O, forming trapezoid $ABCD$ with $\overline{AB} \parallel \overline{DC}$. Which statement must be true?

1 $\overline{AB} \cong \overline{DC}$
2 $\overset{\frown}{AD} \cong \overset{\frown}{BC}$
3 $\angle A \cong \angle D$
4 $\overset{\frown}{AB} \cong \overset{\frown}{DC}$

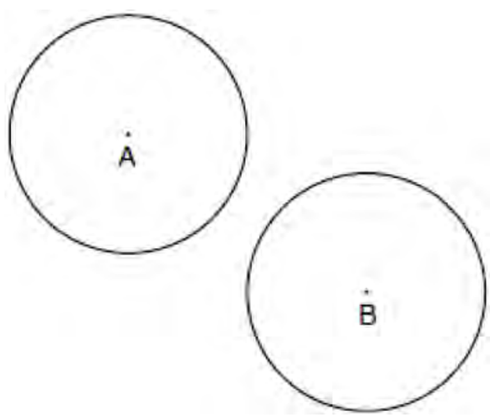
492 Parallel secants $\overleftrightarrow{FH}$ and $\overleftrightarrow{GJ}$ intersect circle O, as shown in the diagram below.



If $m\overset{\frown}{FH} = 106$ and $m\overset{\frown}{GJ} = 24$, then $m\overset{\frown}{FG}$ equals
1 106
2 115
3 130
4 156

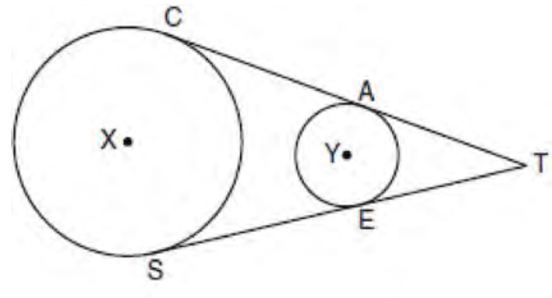
G.G.50: TANGENTS

493 In the diagram below, circle A and circle B are shown.



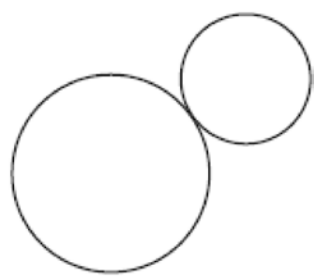
What is the total number of lines of tangency that are common to circle A and circle B?
1 1
2 2
3 3
4 4

494 In the diagram below, circles X and Y have two tangents drawn to them from external point T. The points of tangency are C, A, S, and E. The ratio of TA to AC is $1:3$. If $TS = 24$, find the length of $\overline{SE}$.



(Not drawn to scale)

495 How many common tangent lines can be drawn to the two externally tangent circles shown below?



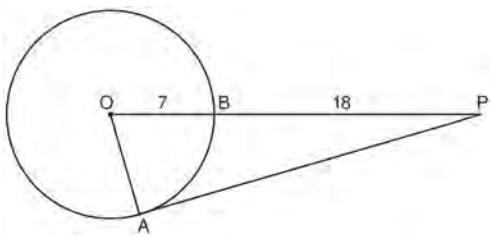
1 1
2 2
3 3
4 4

496 Line segment AB is tangent to circle O at A. Which type of triangle is always formed when points A, B, and O are connected?
1 right
2 obtuse
3 scalene
4 isosceles

Geometry Regents Exam Questions by Performance Indicator: Topic

497 Tangents $\overline{PA}$ and $\overline{PB}$ are drawn to circle O from an external point, P, and radii $\overline{OA}$ and $\overline{OB}$ are drawn. If $m\angle APB = 40$, what is the measure of $\angle AOB$?
1 140º
2 100º
3 70º
4 50º

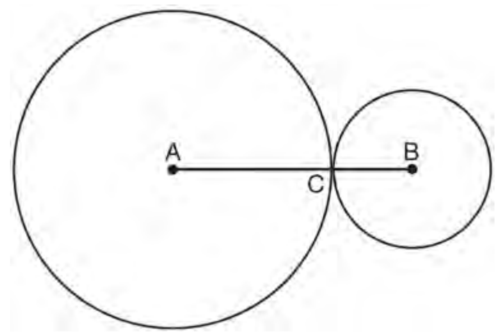
498 In the diagram below of $\triangle PAO$, $\overline{AP}$ is tangent to circle O at point A, $OB = 7$, and $BP = 18$.



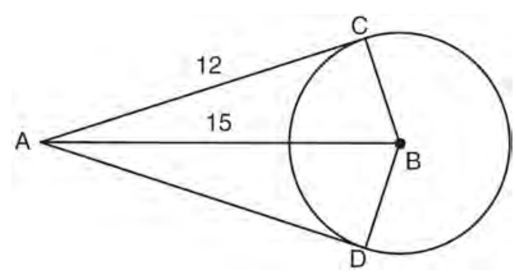
What is the length of $\overline{AP}$?
1 10
2 12
3 17
4 24

499 The angle formed by the radius of a circle and a tangent to that circle has a measure of
1 45°
2 90°
3 135°
4 180°

500 In the diagram below, circles A and B are tangent at point C and $\overline{AB}$ is drawn. Sketch all common tangent lines.

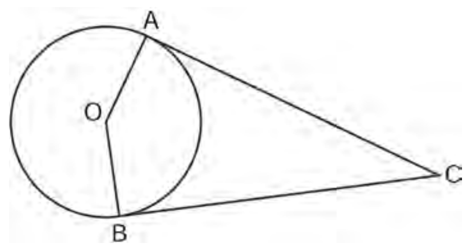


501 In the diagram below, $\overline{AC}$ and $\overline{AD}$ are tangent to circle B at points C and D, respectively, and $\overline{BC}$, $\overline{BD}$, and $\overline{BA}$ are drawn.



If $AC = 12$ and $AB = 15$, what is the length of $\overline{BD}$?
1 5.5
2 9
3 12
4 18

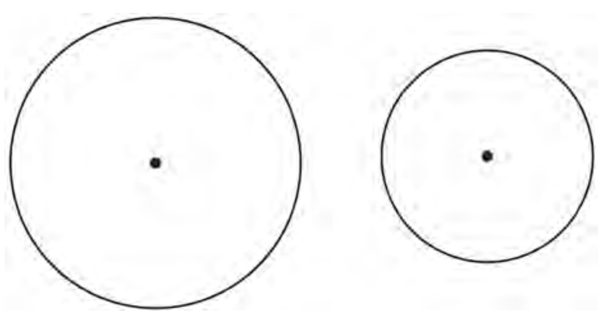
502 In the diagram below, $\overline{AC}$ and $\overline{BC}$ are tangent to circle O at A and B, respectively, from external point C.



If $m\angle ACB = 38$, what is $m\angle AOB$?
1 71
2 104
3 142
4 161

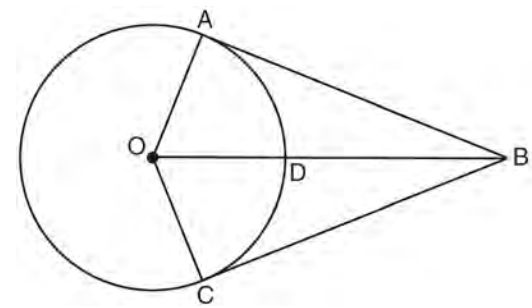
503 From external point A, two tangents to circle O are drawn. The points of tangency are B and C. Chord $\overline{BC}$ is drawn to form $\triangle ABC$. If $m\angle ABC = 66$, what is $m\angle A$?
1 33
2 48
3 57
4 66

504 How many common tangent lines can be drawn to the circles shown below?



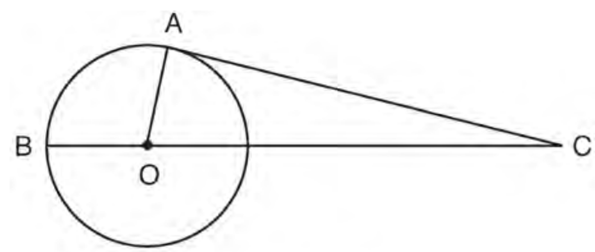
1 1
2 2
3 3
4 4

505 As shown in the diagram below, $\overline{BO}$ and tangents $\overline{BA}$ and $\overline{BC}$ are drawn from external point B to circle O. Radii $\overline{OA}$ and $\overline{OC}$ are drawn.



If $OA = 7$ and $DB = 18$, determine and state the length of $\overline{AB}$.

506 In the diagram below of circle O with radius $\overline{OA}$, tangent $\overline{CA}$ and secant $\overline{COB}$ are drawn.

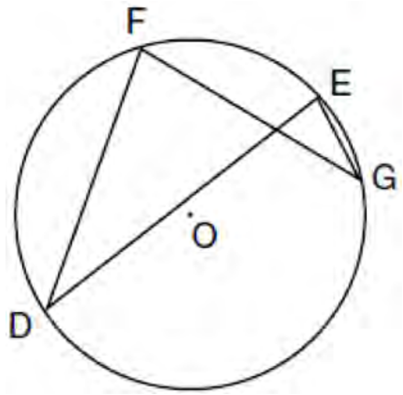


(Not drawn to scale)

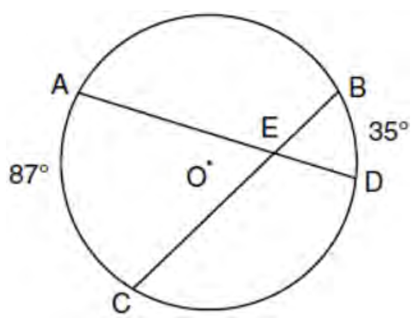
If $AC = 20$ cm and $OA = 7$ cm, what is the length of $\overline{OC}$, to the *nearest centimeter*?
1 19
2 20
3 21
4 27

G.G.51: ARCS DETERMINED BY ANGLES

507 In the diagram below of circle O, chords $\overline{DF}$, $\overline{DE}$, $\overline{FG}$, and $\overline{EG}$ are drawn such that $m\overset{\frown}{DF}:m\overset{\frown}{FE}:m\overset{\frown}{EG}:m\overset{\frown}{GD} = 5:2:1:7$. Identify one pair of inscribed angles that are congruent to each other and give their measure.

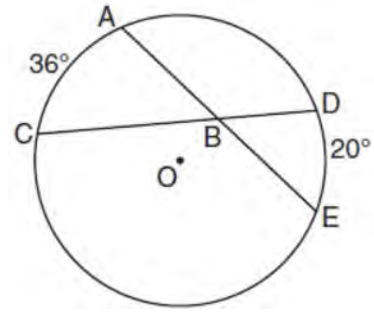


508 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E, $m\overset{\frown}{AC} = 87$, and $m\overset{\frown}{BD} = 35$.



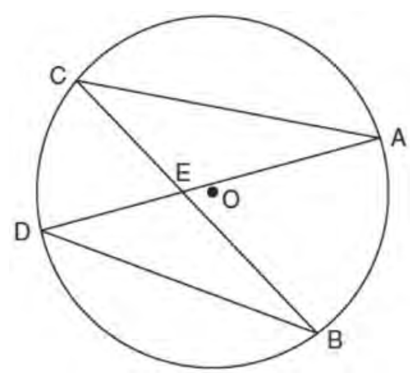
What is the degree measure of $\angle CEA$?
1 87
2 61
3 43.5
4 26

509 In the diagram below of circle O, chords $\overline{AE}$ and $\overline{DC}$ intersect at point B, such that $m\overset{\frown}{AC} = 36$ and $m\overset{\frown}{DE} = 20$.



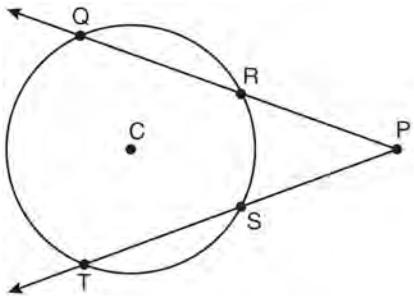
What is $m\angle ABC$?
1 56
2 36
3 28
4 8

510 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E.



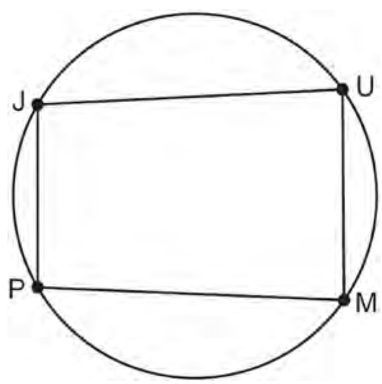
Which relationship must be true?
1 $\triangle CAE \cong \triangle DBE$
2 $\triangle AEC \sim \triangle BED$
3 $\angle ACB \cong \angle CBD$
4 $\overset{\frown}{CA} \cong \overset{\frown}{DB}$

511 In the diagram below of circle C, $m\overset{\frown}{QT} = 140$, and $m\angle P = 40$.



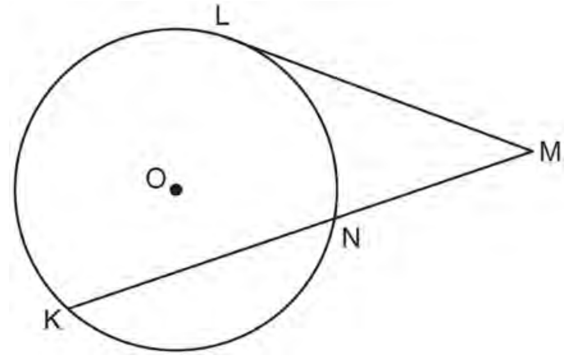
What is $m\overset{\frown}{RS}$?
1 50
2 60
3 90
4 110

512 In the diagram below, quadrilateral $JUMP$ is inscribed in a circle..

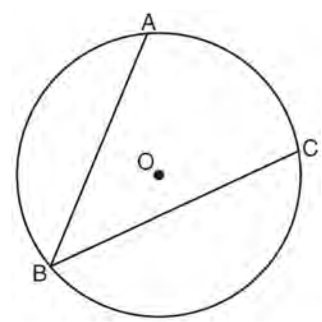


Opposite angles J and M must be
1 right
2 complementary
3 congruent
4 supplementary

513 In the diagram below, tangent $\overline{ML}$ and secant $\overline{MNK}$ are drawn to circle O. The ratio $m\overset{\frown}{LN} : m\overset{\frown}{NK} : m\overset{\frown}{KL}$ is $3:4:5$. Find $m\angle LMK$.

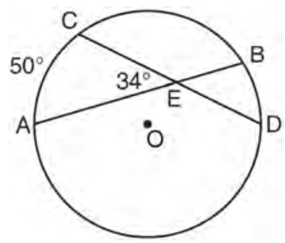


514 In the diagram below, $\angle ABC$ is inscribed in circle O.



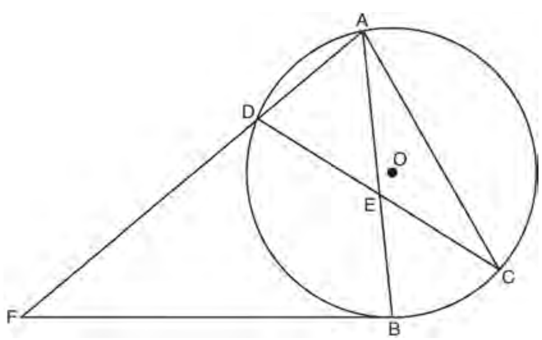
The ratio of the measure of $\angle ABC$ to the measure of $\overset{\frown}{AC}$ is
1 1 : 1
2 1 : 2
3 1 : 3
4 1 : 4

515 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



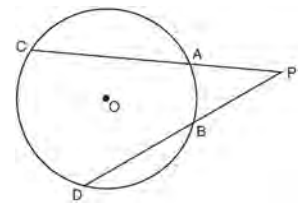
If $m\angle AEC = 34$ and $m\overset{\frown}{AC} = 50$, what is $m\overset{\frown}{DB}$?
1 16
2 18
3 68
4 118

516 Chords $\overline{AB}$ and $\overline{CD}$ intersect at E in circle O, as shown in the diagram below. Secant $\overline{FDA}$ and tangent $\overline{FB}$ are drawn to circle O from external point F and chord $\overline{AC}$ is drawn. The $m\overset{\frown}{DA} = 56$, $m\overset{\frown}{DB} = 112$, and the ratio of $m\overset{\frown}{AC} : m\overset{\frown}{CB} = 3:1$.



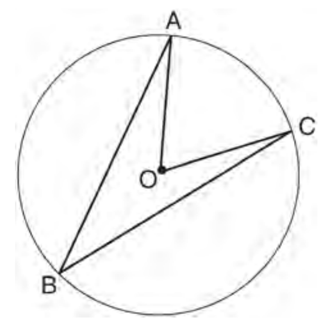
Determine $m\angle CEB$. Determine $m\angle F$. Determine $m\angle DAC$.

517 In the diagram below of circle O, $\overline{PAC}$ and $\overline{PBD}$ are secants.



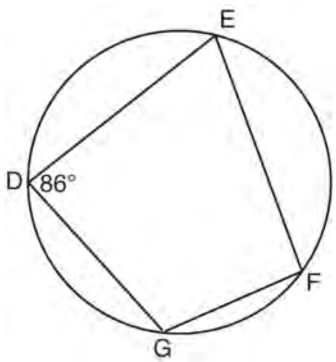
If $m\overset{\frown}{CD} = 70$ and $m\overset{\frown}{AB} = 20$, what is the degree measure of $\angle P$?
1 25
2 35
3 45
4 50

518 Circle O with $\angle AOC$ and $\angle ABC$ is shown in the diagram below.



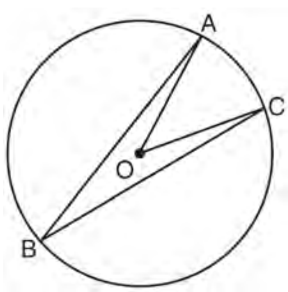
What is the ratio of $m\angle AOC$ to $m\angle ABC$?
1 1 : 1
2 2 : 1
3 3 : 1
4 1 : 2

519 As shown in the diagram below, quadrilateral $DEFG$ is inscribed in a circle and $m\angle D = 86$.



Determine and state $m\overset{\frown}{GFE}$. Determine and state $m\angle F$.

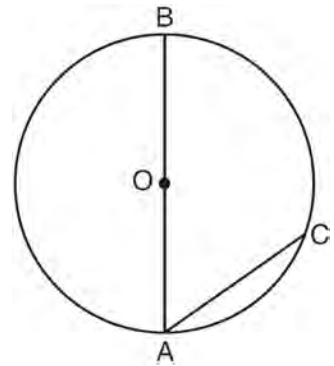
520 In the diagram below of circle O, $m\angle ABC = 24$.



What is the $m\angle AOC$?

1 12
2 24
3 48
4 60

521 As shown in the diagram below, $\overline{AB}$ is a diameter of circle O, and chord $\overline{AC}$ is drawn.

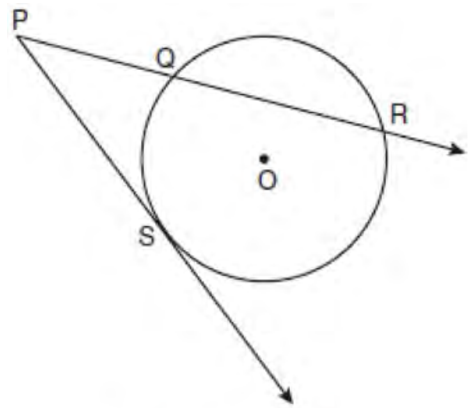


If $m\angle BAC = 70$, then $m\overset{\frown}{AC}$ is

1 40
2 70
3 110
4 140

G.G.53: SEGMENTS INTERCEPTED BY CIRCLE

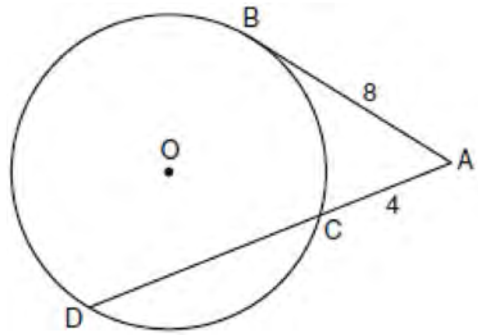
522 In the diagram below, $\overline{PS}$ is a tangent to circle O at point S, $\overline{PQR}$ is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$.



(Not drawn to scale)

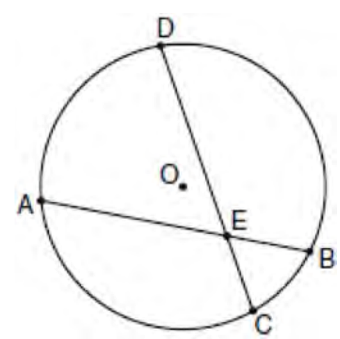
What is the length of $\overline{PS}$?
1 6
2 9
3 3
4 27

523 In the diagram below, tangent $\overline{AB}$ and secant $\overline{ACD}$ are drawn to circle O from an external point A, $AB = 8$, and $AC = 4$.



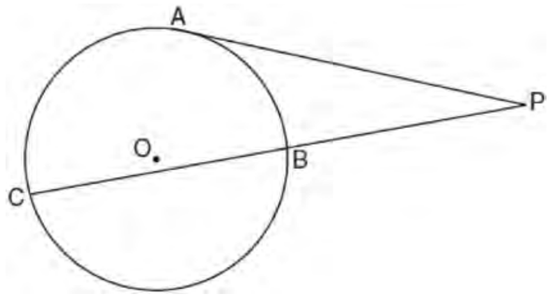
What is the length of $\overline{CD}$?
1 16
2 13
3 12
4 10

524 In the diagram of circle O below, chord $\overline{AB}$ intersects chord $\overline{CD}$ at E, $DE = 2x + 8$, $EC = 3$, $AE = 4x - 3$, and $EB = 4$.



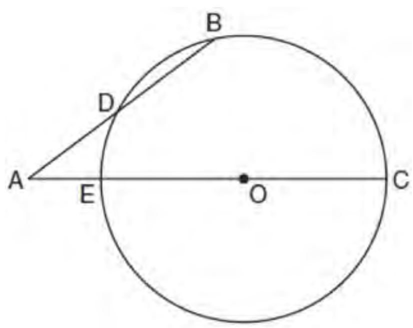
What is the value of x?
1 1
2 3.6
3 5
4 10.25

525 In the diagram below, tangent $\overline{PA}$ and secant $\overline{PBC}$ are drawn to circle O from external point P.



If $PB = 4$ and $BC = 5$, what is the length of $\overline{PA}$?
1 20
2 9
3 8
4 6

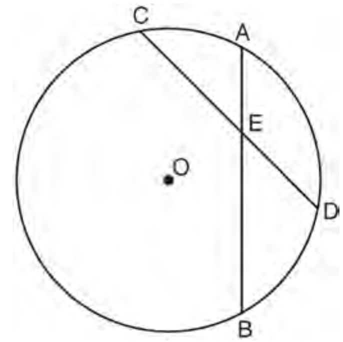
526 In the diagram below of circle O, secant $\overline{AB}$ intersects circle O at D, secant $\overline{AOC}$ intersects circle O at E, $AE = 4$, $AB = 12$, and $DB = 6$.



(Not drawn to scale)

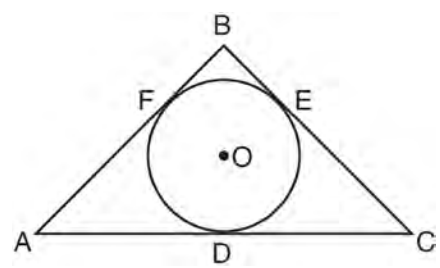
What is the length of $\overline{OC}$?
1 4.5
2 7
3 9
4 14

527 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



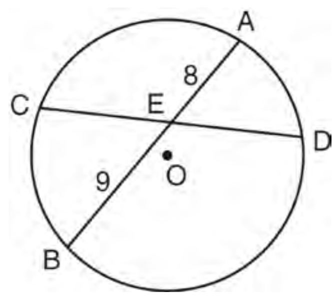
If $CE = 10$, $ED = 6$, and $AE = 4$, what is the length of $\overline{EB}$?
1 15
2 12
3 6.7
4 2.4

528 In the diagram below, $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are tangents to circle O at points F, E, and D, respectively, $AF = 6$, $CD = 5$, and $BE = 4$.

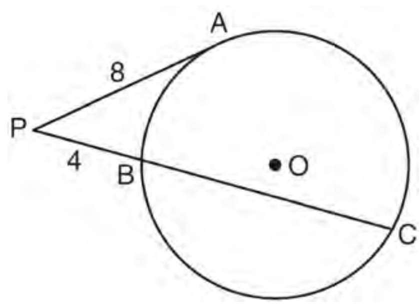


What is the perimeter of $\triangle ABC$?
1 15
2 25
3 30
4 60

529 In the diagram below of circle O, chord $\overline{AB}$ bisects chord $\overline{CD}$ at E. If $AE = 8$ and $BE = 9$, find the length of $\overline{CE}$ in simplest radical form.

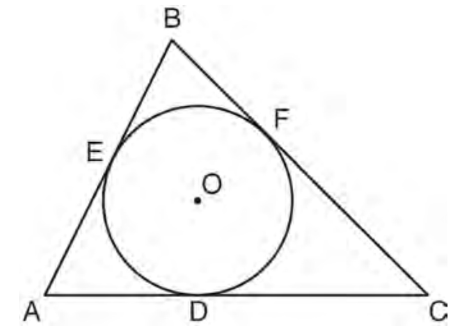


530 In the diagram below of circle O, $\overline{PA}$ is tangent to circle O at A, and $\overline{PBC}$ is a secant with points B and C on the circle.



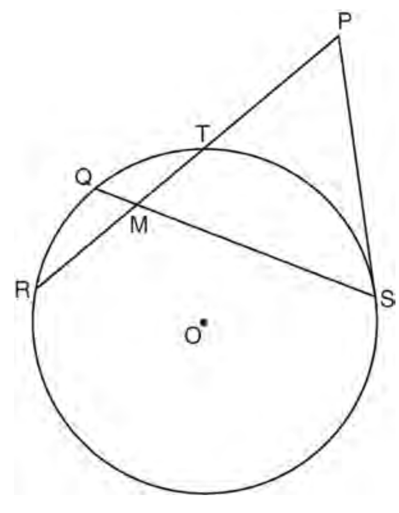
If $PA = 8$ and $PB = 4$, what is the length of $\overline{BC}$?
1 20
2 16
3 15
4 12

531 In the diagram below, $\triangle ABC$ is circumscribed about circle O and the sides of $\triangle ABC$ are tangent to the circle at points D, E, and F.



If $AB = 20$, $AE = 12$, and $CF = 15$, what is the length of $\overline{AC}$?
1 8
2 15
3 23
4 27

532 In the diagram below of circle O, chords $\overline{RT}$ and $\overline{QS}$ intersect at M. Secant $\overline{PTR}$ and tangent $\overline{PS}$ are drawn to circle O. The length of $\overline{RM}$ is two more than the length of $\overline{TM}$, $QM = 2$, $SM = 12$, and $PT = 8$.

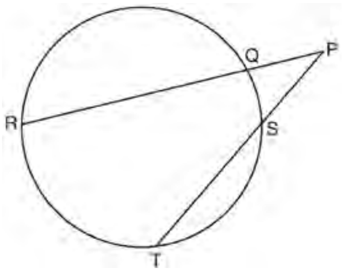


Find the length of $\overline{RT}$. Find the length of $\overline{PS}$.

533 Secants $\overline{JKL}$ and $\overline{JMN}$ are drawn to circle O from an external point, J. If $JK = 8$, $LK = 4$, and $JM = 6$, what is the length of $\overline{JN}$?
1 16
2 12
3 10
4 8

534 Chords $\overline{AB}$ and $\overline{CD}$ intersect at point E in a circle with center at O. If $AE = 8$, $AB = 20$, and $DE = 16$, what is the length of $\overline{CE}$?
1 6
2 9
3 10
4 12

535 In the diagram below, secants $\overline{PQR}$ and $\overline{PST}$ are drawn to a circle from point P.



If $PR = 24$, $PQ = 6$, and $PS = 8$, determine and state the length of $\overline{PT}$.

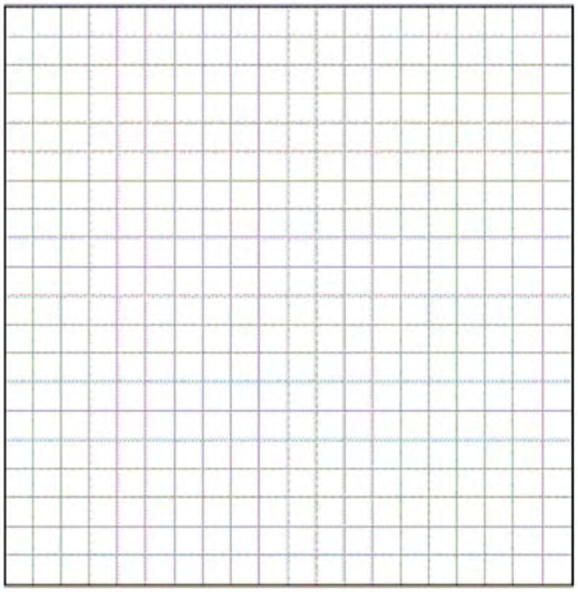
G.G.71: EQUATIONS OF CIRCLES

536 The diameter of a circle has endpoints at $(-2,3)$ and $(6,3)$. What is an equation of the circle?
1 $(x-2)^2 + (y-3)^2 = 16$
2 $(x-2)^2 + (y-3)^2 = 4$
3 $(x+2)^2 + (y+3)^2 = 16$
4 $(x+2)^2 + (y+3)^2 = 4$

537 What is an equation of a circle with its center at $(-3,5)$ and a radius of 4?
1 $(x-3)^2 + (y+5)^2 = 16$
2 $(x+3)^2 + (y-5)^2 = 16$
3 $(x-3)^2 + (y+5)^2 = 4$
4 $(x+3)^2 + (y-5)^2 = 4$

538 Which equation represents the circle whose center is $(-2,3)$ and whose radius is 5?
1 $(x-2)^2 + (y+3)^2 = 5$
2 $(x+2)^2 + (y-3)^2 = 5$
3 $(x+2)^2 + (y-3)^2 = 25$
4 $(x-2)^2 + (y+3)^2 = 25$

539 Write an equation of the circle whose diameter $\overline{AB}$ has endpoints $A(-4,2)$ and $B(4,-4)$. [The use of the grid below is optional.]



540 What is the equation of a circle with its center at $(5,-2)$ and a radius of 3?
1 $(x-5)^2+(y+2)^2=3$
2 $(x-5)^2+(y+2)^2=9$
3 $(x+5)^2+(y-2)^2=3$
4 $(x+5)^2+(y-2)^2=9$

541 What is an equation of a circle with center $(7,-3)$ and radius 4?
1 $(x-7)^2+(y+3)^2=4$
2 $(x+7)^2+(y-3)^2=4$
3 $(x-7)^2+(y+3)^2=16$
4 $(x+7)^2+(y-3)^2=16$

542 What is an equation of the circle with a radius of 5 and center at $(1,-4)$?
1 $(x+1)^2+(y-4)^2=5$
2 $(x-1)^2+(y+4)^2=5$
3 $(x+1)^2+(y-4)^2=25$
4 $(x-1)^2+(y+4)^2=25$

543 Which equation represents circle *O* with center $(2,-8)$ and radius 9?
1 $(x+2)^2+(y-8)^2=9$
2 $(x-2)^2+(y+8)^2=9$
3 $(x+2)^2+(y-8)^2=81$
4 $(x-2)^2+(y+8)^2=81$

544 What is the equation of a circle whose center is 4 units above the origin in the coordinate plane and whose radius is 6?
1 $x^2+(y-6)^2=16$
2 $(x-6)^2+y^2=16$
3 $x^2+(y-4)^2=36$
4 $(x-4)^2+y^2=36$

545 The equation of a circle with its center at $(-3,5)$ and a radius of 4 is
1 $(x+3)^2+(y-5)^2=4$
2 $(x-3)^2+(y+5)^2=4$
3 $(x+3)^2+(y-5)^2=16$
4 $(x-3)^2+(y+5)^2=16$

546 Write an equation of a circle whose center is $(-3,2)$ and whose diameter is 10.

547 Which equation represents the circle whose center is $(-5,3)$ and that passes through the point $(-1,3)$?
1 $(x+1)^2+(y-3)^2=16$
2 $(x-1)^2+(y+3)^2=16$
3 $(x+5)^2+(y-3)^2=16$
4 $(x-5)^2+(y+3)^2=16$

548 What is an equation of the circle with center $(-5,4)$ and a radius of 7?
1 $(x-5)^2+(y+4)^2=14$
2 $(x-5)^2+(y+4)^2=49$
3 $(x+5)^2+(y-4)^2=14$
4 $(x+5)^2+(y-4)^2=49$

549 What is the equation of the circle with its center at $(-1,2)$ and that passes through the point $(1,2)$?
1 $(x+1)^2+(y-2)^2=4$
2 $(x-1)^2+(y+2)^2=4$
3 $(x+1)^2+(y-2)^2=2$
4 $(x-1)^2+(y+2)^2=2$

550 The coordinates of the endpoints of the diameter of a circle are $(2,0)$ and $(2,-8)$. What is the equation of the circle?

1 $(x-2)^2+(y+4)^2=16$
2 $(x+2)^2+(y-4)^2=16$
3 $(x-2)^2+(y+4)^2=8$
4 $(x+2)^2+(y-4)^2=8$

551 A circle whose center has coordinates $(-3,4)$ passes through the origin. What is the equation of the circle?

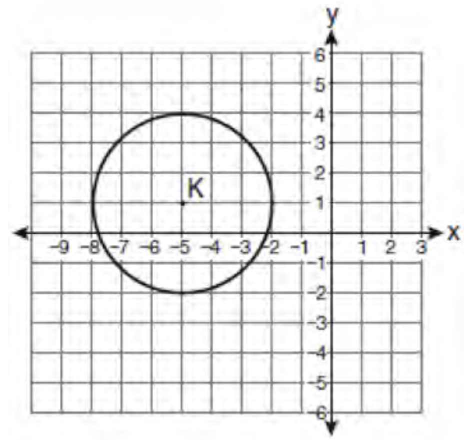
1 $(x+3)^2+(y-4)^2=5$
2 $(x+3)^2+(y-4)^2=25$
3 $(x-3)^2+(y+4)^2=5$
4 $(x-3)^2+(y+4)^2=25$

552 Which equation represents a circle whose center is the origin and that passes through the point $(-4,0)$?

1 $x^2+y^2=8$
2 $x^2+y^2=16$
3 $(x+4)^2+y^2=8$
4 $(x+4)^2+y^2=16$

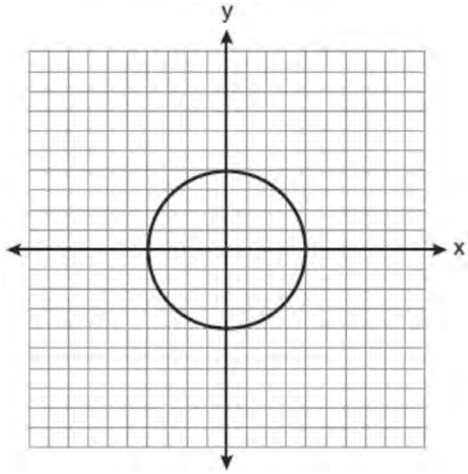
G.G.72: EQUATIONS OF CIRCLES

553 Which equation represents circle K shown in the graph below?



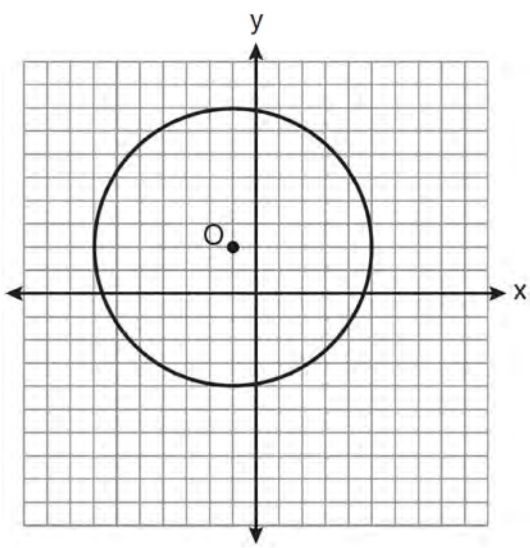
1 $(x+5)^2+(y-1)^2=3$
2 $(x+5)^2+(y-1)^2=9$
3 $(x-5)^2+(y+1)^2=3$
4 $(x-5)^2+(y+1)^2=9$

554 What is an equation for the circle shown in the graph below?

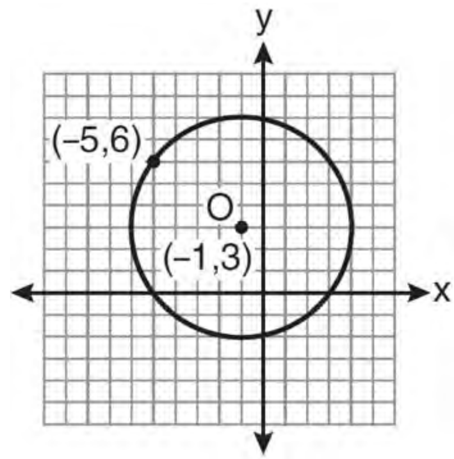


1 $x^2 + y^2 = 2$
2 $x^2 + y^2 = 4$
3 $x^2 + y^2 = 8$
4 $x^2 + y^2 = 16$

555 Write an equation for circle *O* shown on the graph below.

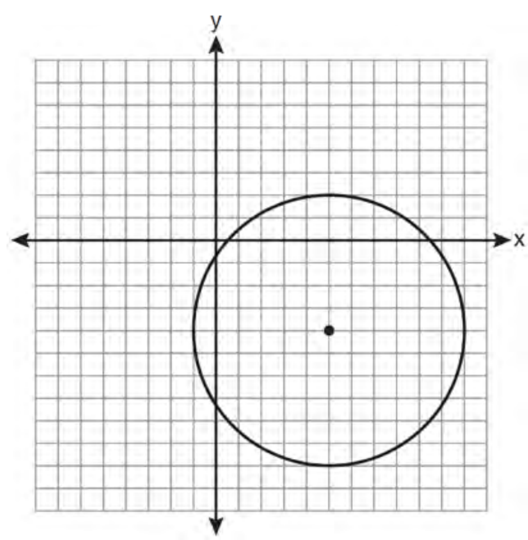


556 What is an equation of circle *O* shown in the graph below?

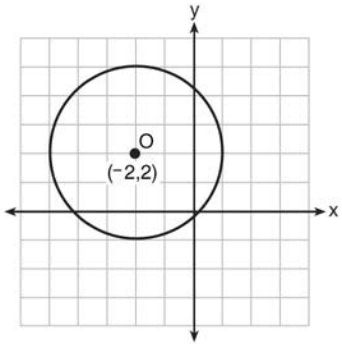


1 $(x+1)^2 + (y-3)^2 = 25$
2 $(x-1)^2 + (y+3)^2 = 25$
3 $(x-5)^2 + (y+6)^2 = 25$
4 $(x+5)^2 + (y-6)^2 = 25$

557 Write an equation of the circle graphed in the diagram below.

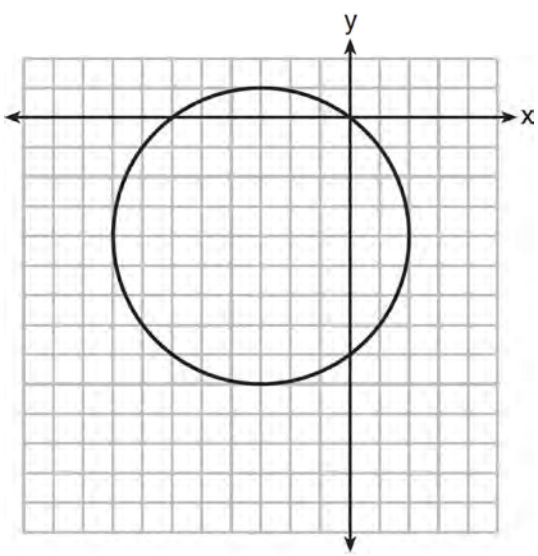


558 What is an equation of circle *O* shown in the graph below?



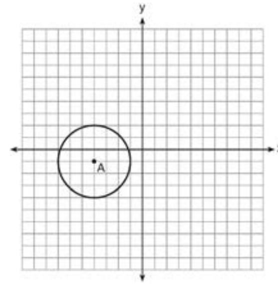
1 $(x+2)^2+(y-2)^2=9$
2 $(x+2)^2+(y-2)^2=3$
3 $(x-2)^2+(y+2)^2=9$
4 $(x-2)^2+(y+2)^2=3$

559 What is an equation of the circle shown in the graph below?



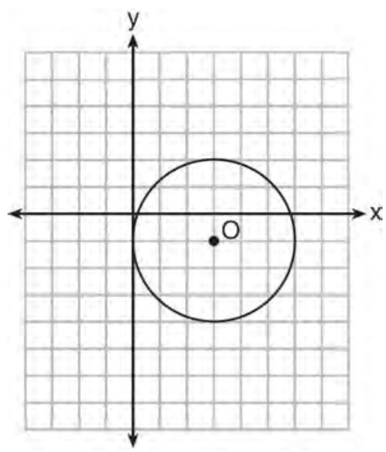
1 $(x-3)^2+(y-4)^2=25$
2 $(x+3)^2+(y+4)^2=25$
3 $(x-3)^2+(y-4)^2=10$
4 $(x+3)^2+(y+4)^2=10$

560 Which equation represents circle *A* shown in the diagram below?



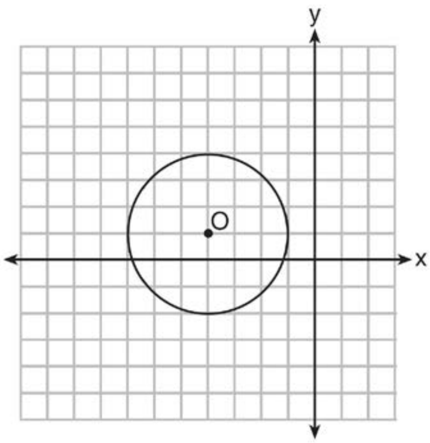
1 $(x-4)^2+(y-1)^2=3$
2 $(x+4)^2+(y+1)^2=3$
3 $(x-4)^2+(y-1)^2=9$
4 $(x+4)^2+(y+1)^2=9$

561 What is the equation for circle *O* shown in the graph below?



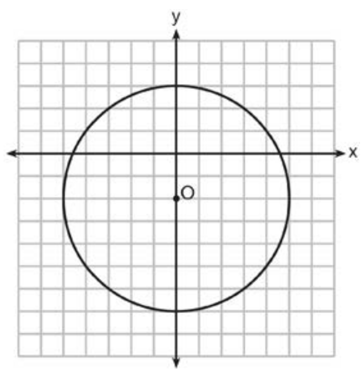
1 $(x-3)^2+(y+1)^2=6$
2 $(x+3)^2+(y-1)^2=6$
3 $(x-3)^2+(y+1)^2=9$
4 $(x+3)^2+(y-1)^2=9$

562 What is the equation of circle O shown in the diagram below?



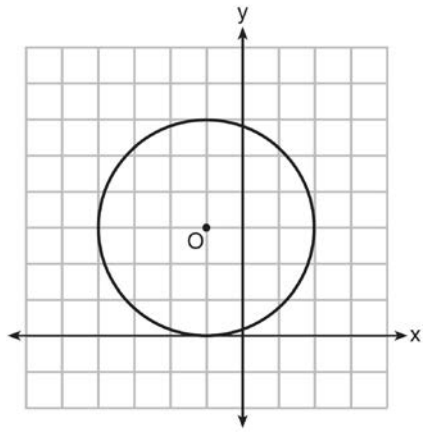
1 $(x+4)^2+(y-1)^2=3$
2 $(x-4)^2+(y+1)^2=3$
3 $(x+4)^2+(y-1)^2=9$
4 $(x-4)^2+(y+1)^2=9$

563 Which equation represents circle O shown in the graph below?



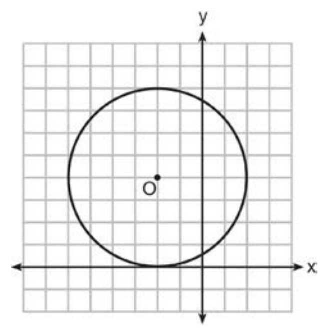
1 $x^2+(y-2)^2=10$
2 $x^2+(y+2)^2=10$
3 $x^2+(y-2)^2=25$
4 $x^2+(y+2)^2=25$

564 Circle O is graphed on the set of axes below. Which equation represents circle O?



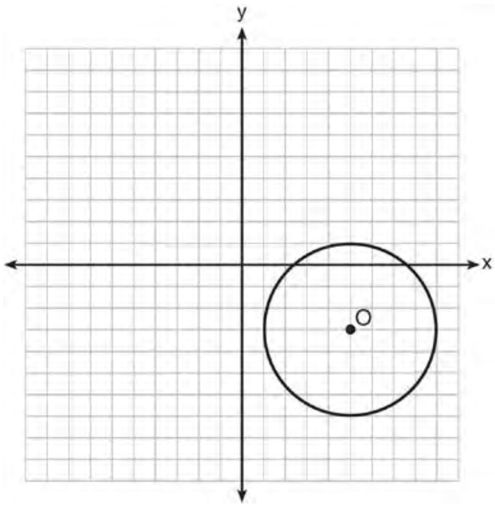
1 $(x+1)^2+(y-3)^2=9$
2 $(x-1)^2+(y+3)^2=9$
3 $(x+1)^2+(y-3)^2=6$
4 $(x-1)^2+(y+3)^2=6$

565 What is an equation of circle O shown in the graph below?



1 $(x-2)^2+(y+4)^2=4$
2 $(x-2)^2+(y+4)^2=16$
3 $(x+2)^2+(y-4)^2=4$
4 $(x+2)^2+(y-4)^2=16$

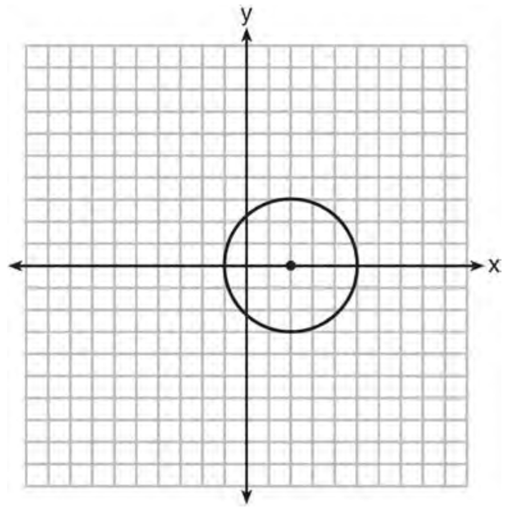
566 The diagram below is a graph of circle *O*.



Which equation represents circle *O*?

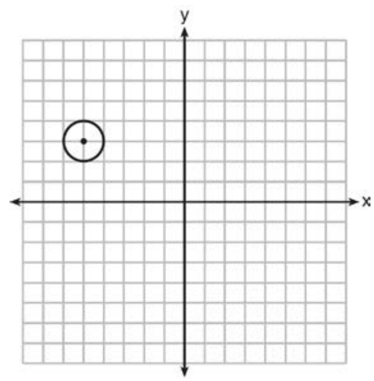
1 $(x-5)^2+(y+3)^2=4$
2 $(x+5)^2+(y-3)^2=4$
3 $(x-5)^2+(y+3)^2=16$
4 $(x+5)^2+(y-3)^2=16$

567 Which equation represents the circle shown in the graph below?



1 $(x-2)^2+y^2=9$
2 $(x+2)^2+y^2=9$
3 $(x-2)^2+y^2=3$
4 $(x+2)^2+y^2=3$

568 Which equation represents the circle shown in the graph below?



1 $(x-5)^2+(y+3)^2=1$
2 $(x+5)^2+(y-3)^2=1$
3 $(x-5)^2+(y+3)^2=2$
4 $(x+5)^2+(y-3)^2=2$

G.G.73: EQUATIONS OF CIRCLES

569 What are the center and radius of a circle whose equation is $(x-A)^2+(y-B)^2=C$?
1 center = (A,B); radius = C
2 center = $(-A,-B)$; radius = C
3 center = (A,B); radius = $\sqrt{C}$
4 center = $(-A,-B)$; radius = $\sqrt{C}$

570 A circle is represented by the equation $x^2+(y+3)^2=13$. What are the coordinates of the center of the circle and the length of the radius?
1 $(0,3)$ and 13
2 $(0,3)$ and $\sqrt{13}$
3 $(0,-3)$ and 13
4 $(0,-3)$ and $\sqrt{13}$

571 What are the center and the radius of the circle whose equation is $(x-3)^2+(y+3)^2=36$
1 center = $(3,-3)$; radius = 6
2 center = $(-3,3)$; radius = 6
3 center = $(3,-3)$; radius = 36
4 center = $(-3,3)$; radius = 36

572 The equation of a circle is $x^2+(y-7)^2=16$. What are the center and radius of the circle?
1 center = $(0,7)$; radius = 4
2 center = $(0,7)$; radius = 16
3 center = $(0,-7)$; radius = 4
4 center = $(0,-7)$; radius = 16

573 What are the center and the radius of the circle whose equation is $(x-5)^2+(y+3)^2=16$?
1 $(-5,3)$ and 16
2 $(5,-3)$ and 16
3 $(-5,3)$ and 4
4 $(5,-3)$ and 4

574 A circle has the equation $(x-2)^2+(y+3)^2=36$. What are the coordinates of its center and the length of its radius?
1 $(-2,3)$ and 6
2 $(2,-3)$ and 6
3 $(-2,3)$ and 36
4 $(2,-3)$ and 36

575 Which equation of a circle will have a graph that lies entirely in the first quadrant?
1 $(x-4)^2+(y-5)^2=9$
2 $(x+4)^2+(y+5)^2=9$
3 $(x+4)^2+(y+5)^2=25$
4 $(x-5)^2+(y-4)^2=25$

576 The equation of a circle is $(x-2)^2+(y+5)^2=32$. What are the coordinates of the center of this circle and the length of its radius?
1 $(-2,5)$ and 16
2 $(2,-5)$ and 16
3 $(-2,5)$ and $4\sqrt{2}$
4 $(2,-5)$ and $4\sqrt{2}$

577 Which set of equations represents two circles that have the same center?
1 $x^2+(y+4)^2=16$ and $(x+4)^2+y^2=16$
2 $(x+3)^2+(y-3)^2=16$ and $(x-3)^2+(y+3)^2=25$
3 $(x-7)^2+(y-2)^2=16$ and $(x+7)^2+(y+2)^2=25$
4 $(x-2)^2+(y-5)^2=16$ and $(x-2)^2+(y-5)^2=25$

578 A circle has the equation $(x-3)^2+(y+4)^2=10$. Find the coordinates of the center of the circle and the length of the circle's radius.

579 What are the coordinates of the center and the length of the radius of the circle whose equation is $(x+1)^2 + (y-5)^2 = 16$?
1 $(1,-5)$ and 16
2 $(-1,5)$ and 16
3 $(1,-5)$ and 4
4 $(-1,5)$ and 4

580 A circle with the equation $(x+6)^2 + (y-7)^2 = 64$ does *not* include points in Quadrant
1 I
2 II
3 III
4 IV

581 The equation of a circle is $(x-3)^2 + y^2 = 8$. The coordinates of its center and the length of its radius are
1 $(-3,0)$ and 4
2 $(3,0)$ and 4
3 $(-3,0)$ and $2\sqrt{2}$
4 $(3,0)$ and $2\sqrt{2}$

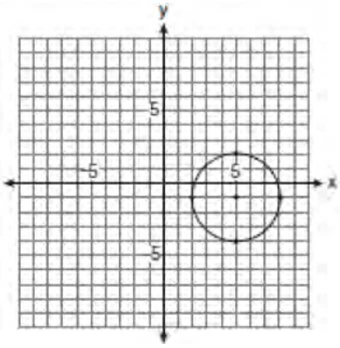
582 Circle O is represented by the equation $(x+3)^2 + (y-5)^2 = 48$. The coordinates of the center and the length of the radius of circle O are
1 $(-3,5)$ and $4\sqrt{3}$
2 $(-3,5)$ and 24
3 $(3,-5)$ and $4\sqrt{3}$
4 $(3,-5)$ and 24

583 Students made four statements about a circle.
A: The coordinates of its center are $(4,-3)$.
B: The coordinates of its center are $(-4,3)$.
C: The length of its radius is $5\sqrt{2}$.
D: The length of its radius is 25.
If the equation of the circle is $(x+4)^2 + (y-3)^2 = 50$, which statements are correct?
1 *A* and *C*
2 *A* and *D*
3 *B* and *C*
4 *B* and *D*

584 In a circle whose equation is $(x-1)^2 + (y+3)^2 = 9$, the coordinates of the center and length of its radius are
1 $(1,-3)$ and $r = 81$
2 $(-1,3)$ and $r = 81$
3 $(1,-3)$ and $r = 3$
4 $(-1,3)$ and $r = 3$

G.G.74: GRAPHING CIRCLES

585 Which graph represents a circle with the equation $(x-5)^2+(y+1)^2=9$?

1


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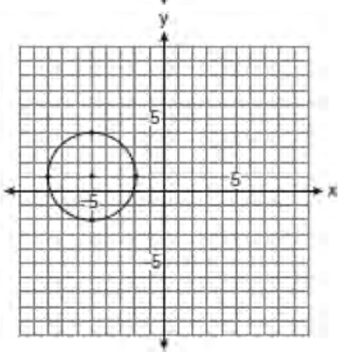

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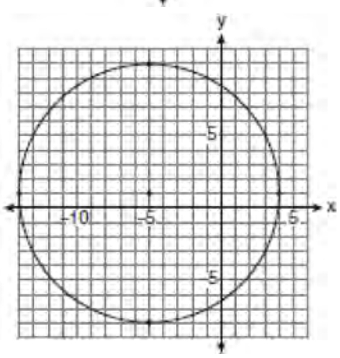

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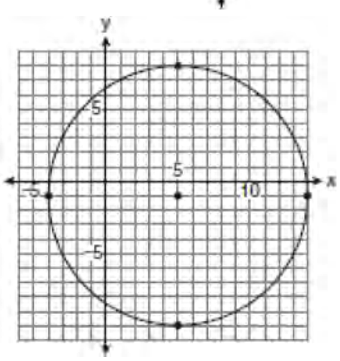
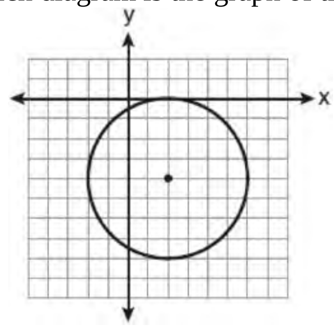


586 The equation of a circle is $(x-2)^2+(y+4)^2=4$. Which diagram is the graph of the circle?

1


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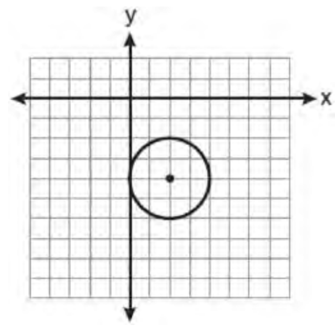

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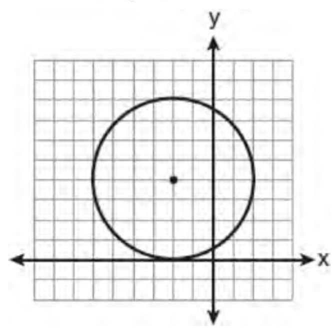

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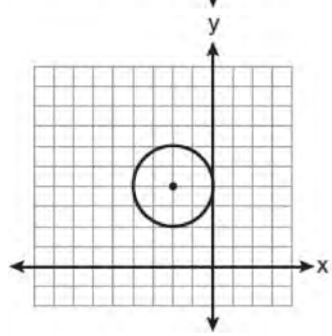
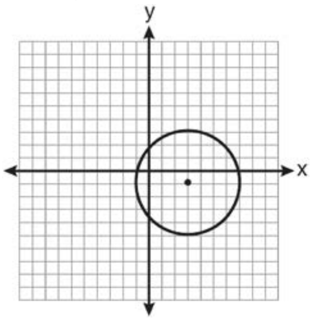
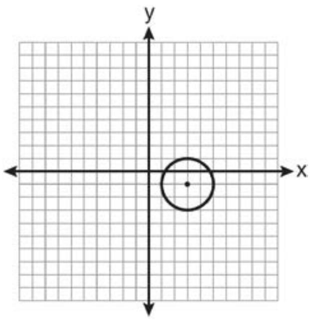


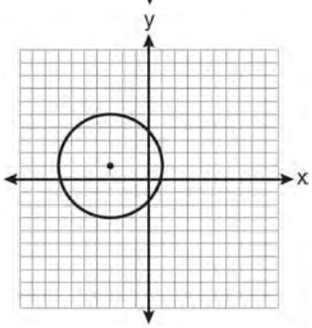
587 Which graph represents a circle with the equation $(x-3)^2+(y+1)^2=4$?



1



2



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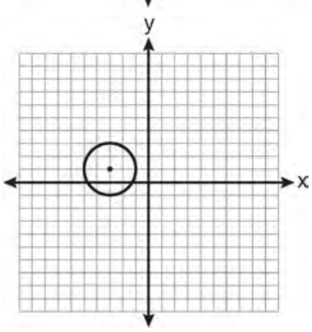
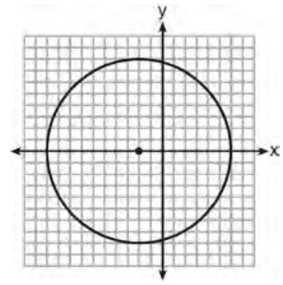
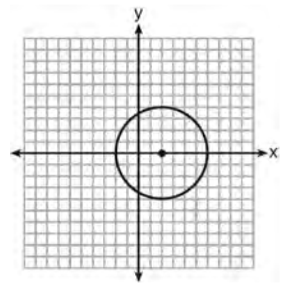


4

588 Which graph represents a circle whose equation is $(x+2)^2+y^2=16$?



1



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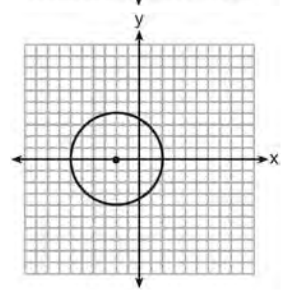

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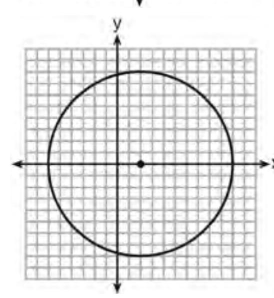
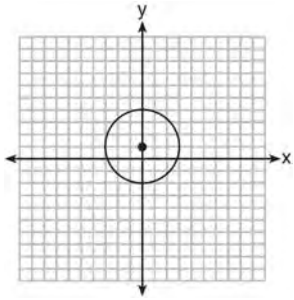


4

589 Which graph represents a circle whose equation is $x^2 + (y-1)^2 = 9$?



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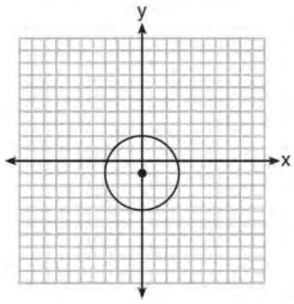

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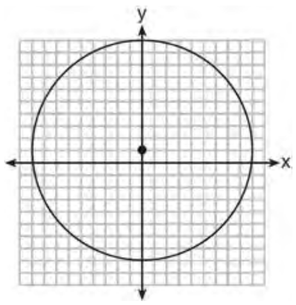
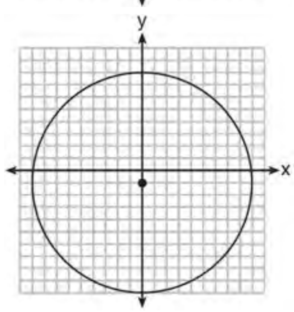
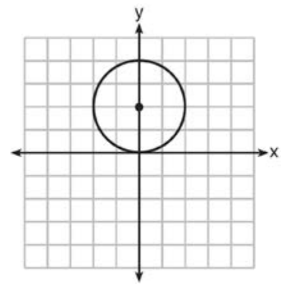


3



4

590 Which graph represents a circle whose equation is $x^2 + (y-2)^2 = 4$?



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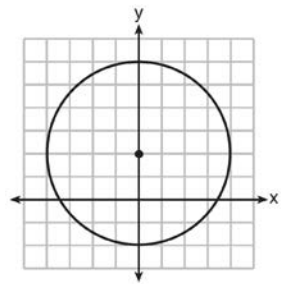

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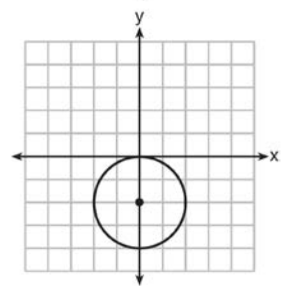

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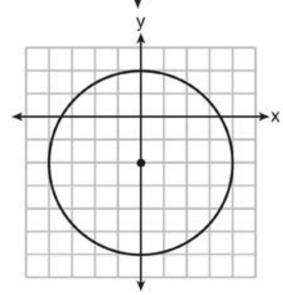
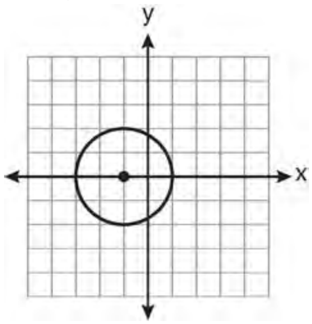
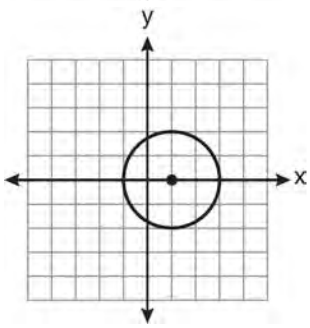


4

591 Which graph represents the graph of the equation $(x-1)^2 + y^2 = 4$?



1



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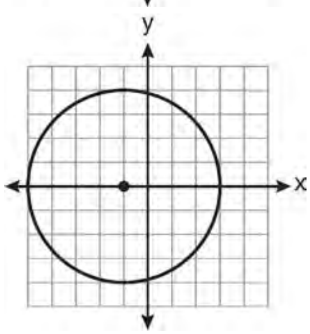

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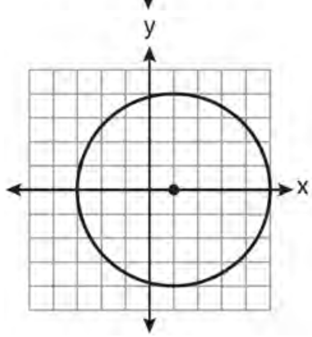
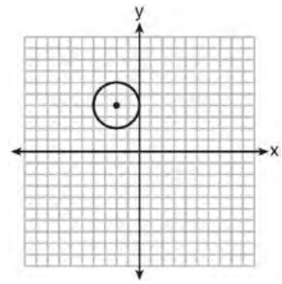
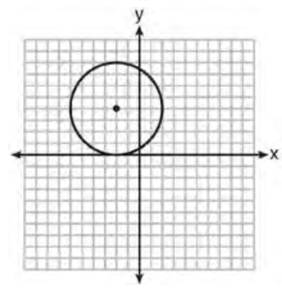


4

592 Which graph represents a circle whose equation is $(x-2)^2 + (y+4)^2 = 4$?



1



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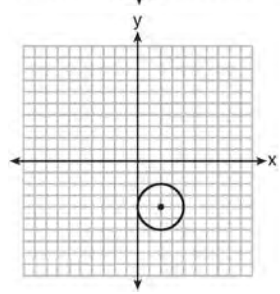

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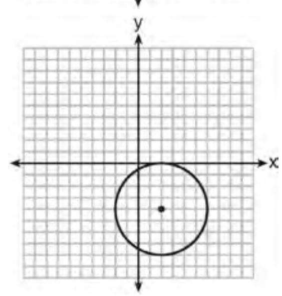
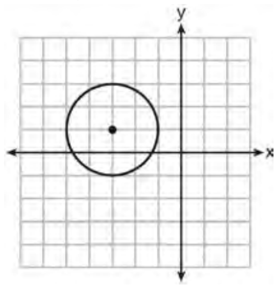
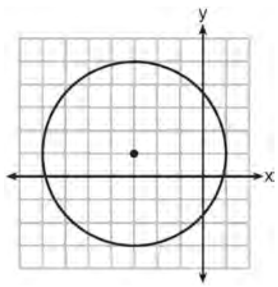
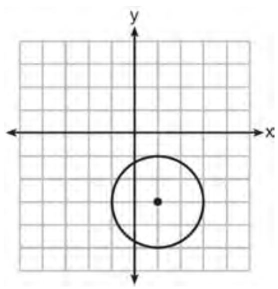


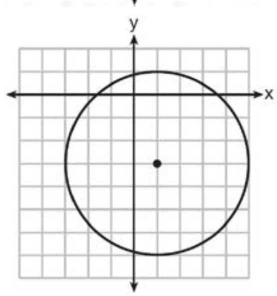
4

593 Which graph represents a circle whose equation is $(x+3)^2+(y-1)^2=4$?

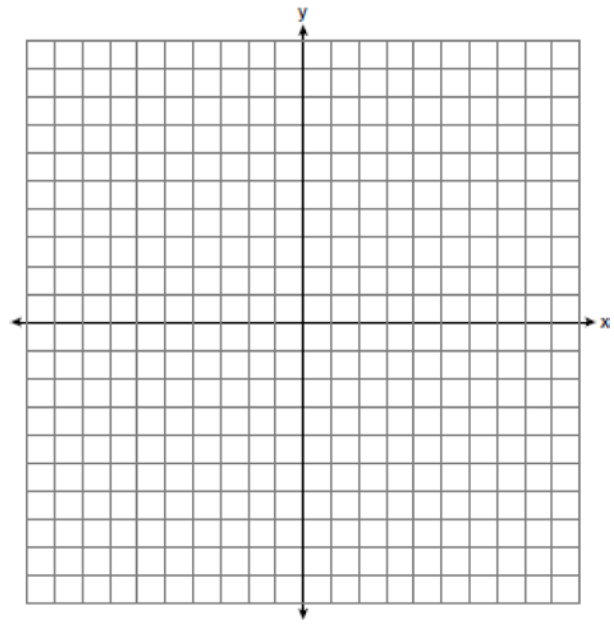
1 

2 

3 

4 

594 On the set of axes below, graph and label circle *A* whose equation is $(x+4)^2+(y-2)^2=16$ and circle *B* whose equation is $x^2+y^2=9$. Determine, in simplest radical form, the length of the line segment with endpoints at the centers of circles *A* and *B*.



MEASURING IN THE PLANE AND SPACE

G.G.11: VOLUME

595 Tim has a rectangular prism with a length of 10 centimeters, a width of 2 centimeters, and an unknown height. He needs to build another rectangular prism with a length of 5 centimeters and the same height as the original prism. The volume of the two prisms will be the same. Find the width, in centimeters, of the new prism.

596 A rectangular prism has a base with a length of 25, a width of 9, and a height of 12. A second prism has a square base with a side of 15. If the volumes of the two prisms are equal, what is the height of the second prism?
1 6
2 8
3 12
4 15

597 Two prisms have equal heights and equal volumes. The base of one is a pentagon and the base of the other is a square. If the area of the pentagonal base is 36 square inches, how many inches are in the length of each side of the square base?
1 6
2 9
3 24
4 36

598 Two prisms with equal altitudes have equal volumes. The base of one prism is a square with a side length of 5 inches. The base of the second prism is a rectangle with a side length of 10 inches. Determine and state, in inches, the measure of the width of the rectangle.

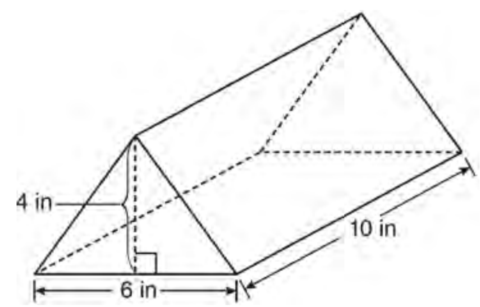
599 A carpenter made a storage container in the shape of a rectangular prism. It is 5 feet high and has a volume of 720 cubic feet. He wants to make a second container with the same height and volume as the first one, but in the shape of a triangular prism. What will be the number of square feet in the area of the base of the new container?
1 36
2 72
3 144
4 288

G.G.12: VOLUME

600 A rectangular prism has a volume of $3x^2 + 18x + 24$. Its base has a length of $x + 2$ and a width of 3. Which expression represents the height of the prism?
1 $x + 4$
2 $x + 2$
3 3
4 $x^2 + 6x + 8$

601 The Parkside Packing Company needs a rectangular shipping box. The box must have a length of 11 inches and a width of 8 inches. Find, to the *nearest tenth of an inch*, the minimum height of the box such that the volume is *at least* 800 cubic inches.

602 A packing carton in the shape of a triangular prism is shown in the diagram below.



What is the volume, in cubic inches, of this carton?
1 20
2 60
3 120
4 240

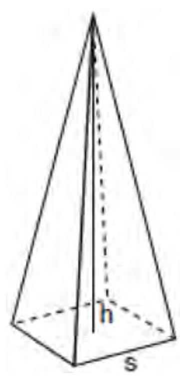
603 The volume of a rectangular prism is 144 cubic inches. The height of the prism is 8 inches. Which measurements, in inches, could be the dimensions of the base?
1 3.3 by 5.5
2 2.5 by 7.2
3 12 by 8
4 9 by 9

604 The base of a right pentagonal prism has an area of 20 square inches. If the prism has an altitude of 8 inches, determine and state the volume of the prism, in cubic inches.

605 A right prism has a square base with an area of 12 square meters. The volume of the prism is 84 cubic meters. Determine and state the height of the prism, in meters.

G.G.13: VOLUME

606 A regular pyramid with a square base is shown in the diagram below.



A side, *s*, of the base of the pyramid is 12 meters, and the height, *h*, is 42 meters. What is the volume of the pyramid in cubic meters?

607 The base of a pyramid is a rectangle with a width of 6 cm and a length of 8 cm. Find, in centimeters, the height of the pyramid if the volume is 288 cm^3.

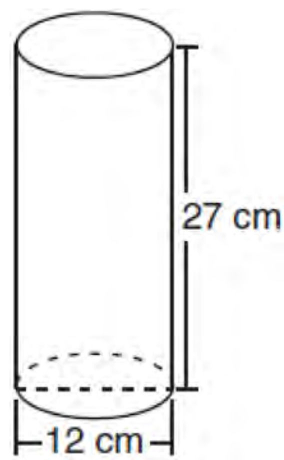
608 A regular pyramid has a height of 12 centimeters and a square base. If the volume of the pyramid is 256 cubic centimeters, how many centimeters are in the length of one side of its base?
1 8
2 16
3 32
4 64

G.G.14: VOLUME AND LATERAL AREA

609 The volume of a cylinder is 12,566.4 cm^3. The height of the cylinder is 8 cm. Find the radius of the cylinder to the *nearest tenth of a centimeter*.

610 A right circular cylinder has a volume of 1,000 cubic inches and a height of 8 inches. What is the radius of the cylinder to the *nearest tenth of an inch*?
1 6.3
2 11.2
3 19.8
4 39.8

611 Which expression represents the volume, in cubic centimeters, of the cylinder represented in the diagram below?



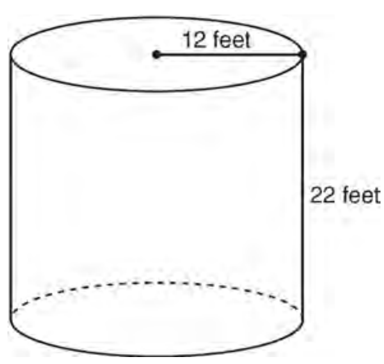
1 162π
2 324π
3 972π
4 $3,888\pi$

612 A right circular cylinder has an altitude of 11 feet and a radius of 5 feet. What is the lateral area, in square feet, of the cylinder, to the *nearest tenth*?
1 172.7
2 172.8
3 345.4
4 345.6

613 What is the volume, in cubic centimeters, of a cylinder that has a height of 15 cm and a diameter of 12 cm?
1 180π
2 540π
3 675π
4 $2,160\pi$

614 A paint can is in the shape of a right circular cylinder. The volume of the paint can is 600π cubic inches and its altitude is 12 inches. Find the radius, in inches, of the base of the paint can. Express the answer in simplest radical form. Find, to the *nearest tenth of a square inch*, the lateral area of the paint can.

615 The cylindrical tank shown in the diagram below is to be painted. The tank is open at the top, and the bottom does *not* need to be painted. Only the outside needs to be painted. Each can of paint covers 600 square feet. How many cans of paint must be purchased to complete the job?



616 A cylinder has a height of 7 cm and a base with a diameter of 10 cm. Determine the volume, in cubic centimeters, of the cylinder in terms of π.

617 A right circular cylinder with a height of 5 cm has a base with a diameter of 6 cm. Find the lateral area of the cylinder to the *nearest hundredth of a square centimeter*. Find the volume of the cylinder to the *nearest hundredth of a cubic centimeter*.

618 A right circular cylinder has a height of 7 inches and the base has a diameter of 6 inches. Determine the lateral area, in square inches, of the cylinder in terms of π.

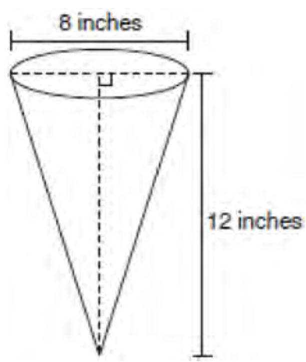
619 As shown in the diagram below, a landscaper uses a cylindrical lawn roller on a lawn. The roller has a radius of 9 inches and a width of 42 inches.

To the *nearest square inch*, the area the roller covers in one complete rotation is
1 2,374
2 2,375
3 10,682
4 10,688

620 The diameter of the base of a right circular cylinder is 6 cm and its height is 15 cm. In square centimeters, the lateral area of the cylinder is
1 180π
2 135π
3 90π
4 45π

G.G.15: VOLUME AND LATERAL AREA

621 In the diagram below, a right circular cone has a diameter of 8 inches and a height of 12 inches.



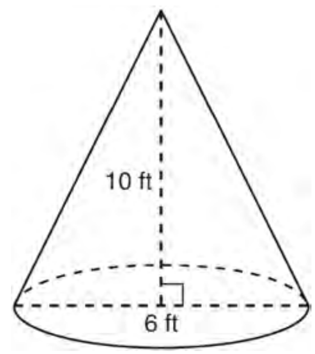
What is the volume of the cone to the *nearest cubic inch*?
1 201
2 481
3 603
4 804

622 A right circular cone has a base with a radius of 15 cm, a vertical height of 20 cm, and a slant height of 25 cm. Find, in terms of' π, the number of square centimeters in the lateral area of the cone.

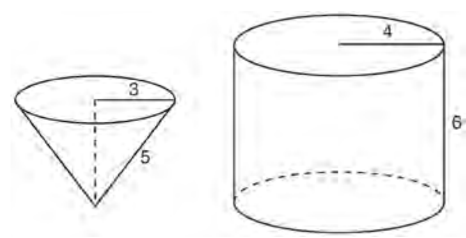
623 The lateral area of a right circular cone is equal to 120π cm^2. If the base of the cone has a diameter of 24 cm, what is the length of the slant height, in centimeters?
1 2.5
2 5
3 10
4 15.7

624 A right circular cone has a diameter of $10\sqrt{2}$ and a height of 12. What is the volume of the cone in terms of π?
1 200π
2 600π
3 800π
4 2400π

625 A right circular cone has an altitude of 10 ft and the diameter of the base is 6 ft as shown in the diagram below. Determine and state the lateral area of the cone, to the *nearest tenth of a square foot*.

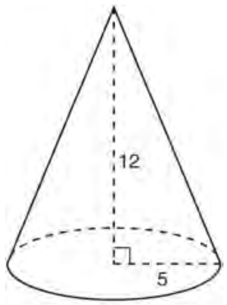


626 In the diagram below, a right circular cone with a radius of 3 inches has a slant height of 5 inches, and a right cylinder with a radius of 4 inches has a height of 6 inches.



Determine and state the number of full cones of water needed to completely fill the cylinder with water.

627 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



Determine, in terms of π, the lateral area of the right circular cone.

628 A paper container in the shape of a right circular cone has a radius of 3 inches and a height of 8 inches. Determine and state the number of cubic inches in the volume of the cone, in terms of π.

G.G.16: VOLUME AND SURFACE AREA

629 Tim is going to paint a wooden sphere that has a diameter of 12 inches. Find the surface area of the sphere, to the *nearest square inch*.

630 If the surface area of a sphere is represented by 144π, what is the volume in terms of π?
1 36π
2 48π
3 216π
4 288π

631 The volume, in cubic centimeters, of a sphere whose diameter is 6 centimeters is
1 12π
2 36π
3 48π
4 288π

632 A sphere has a diameter of 18 meters. Find the volume of the sphere, in cubic meters, in terms of π.

633 The diameter of a sphere is 15 inches. What is the volume of the sphere, to the *nearest tenth of a cubic inch*?
1 706.9
2 1767.1
3 2827.4
4 14,137.2

634 A sphere is inscribed inside a cube with edges of 6 cm. In cubic centimeters, what is the volume of the sphere, in terms of π?
1 12π
2 36π
3 48π
4 288π

635 The volume of a sphere is approximately 44.6022 cubic centimeters. What is the radius of the sphere, to the *nearest tenth of a centimeter*?
1 2.2
2 3.3
3 4.4
4 4.7

636 The diameter of a sphere is 5 inches. Determine and state the surface area of the sphere, to the *nearest hundredth of a square inch*.

637 If the surface area of a sphere is 144π square centimeters, what is the length of the diameter of the sphere, in centimeters?
1 36
2 18
3 12
4 6

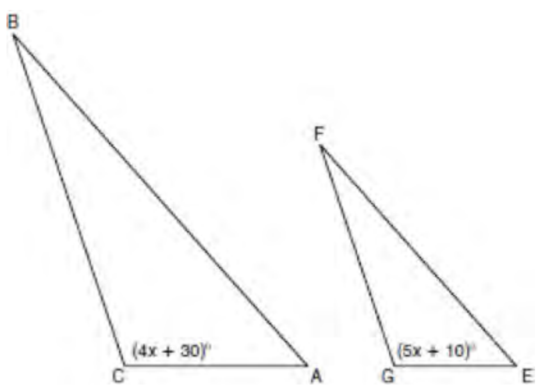
638 The surface area of a sphere is 2304π square inches. The length of a radius of the sphere, in inches, is
1 12
2 24
3 288
4 576

639 The diameter of a sphere is 12 inches. What is the volume of the sphere to the *nearest cubic inch*?
1 288
2 452
3 905
4 7,238

G.G.45: SIMILARITY

640 Two triangles are similar, and the ratio of each pair of corresponding sides is 2:1. Which statement regarding the two triangles is *not* true?
1 Their areas have a ratio of 4:1.
2 Their altitudes have a ratio of 2:1.
3 Their perimeters have a ratio of 2:1.
4 Their corresponding angles have a ratio of 2:1.

641 In the diagram below, $\triangle ABC \sim \triangle EFG$, $m\angle C = 4x + 30$, and $m\angle G = 5x + 10$. Determine the value of x.

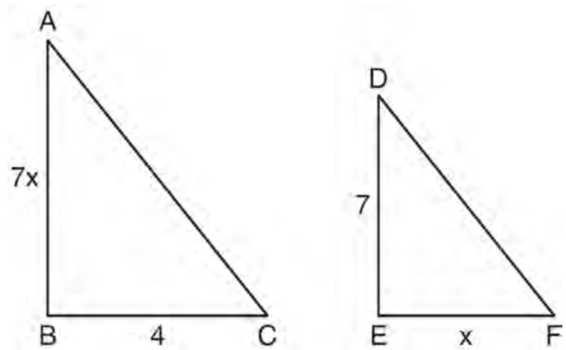


642 Given $\triangle ABC \sim \triangle DEF$ such that $\frac{AB}{DE} = \frac{3}{2}$. Which statement is *not* true?
1 $\frac{BC}{EF} = \frac{3}{2}$
2 $\frac{m\angle A}{m\angle D} = \frac{3}{2}$
3 $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF} = \frac{9}{4}$
4 $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$

643 If $\triangle ABC \sim \triangle ZXY$, $m\angle A = 50$, and $m\angle C = 30$, what is $m\angle X$?
1 30
2 50
3 80
4 100

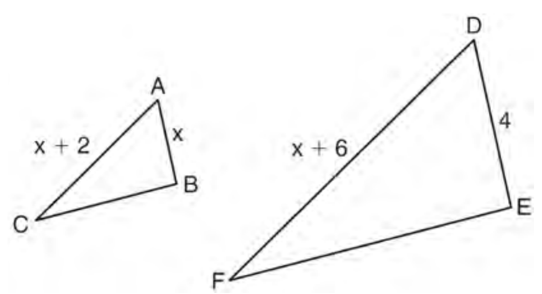
644 $\triangle ABC$ is similar to $\triangle DEF$. The ratio of the length of $\overline{AB}$ to the length of $\overline{DE}$ is 3:1. Which ratio is also equal to 3:1?
1 $\frac{m\angle A}{m\angle D}$
2 $\frac{m\angle B}{m\angle F}$
3 $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$
4 $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$

645 As shown in the diagram below, $\triangle ABC \sim \triangle DEF$, $AB = 7x$, $BC = 4$, $DE = 7$, and $EF = x$.

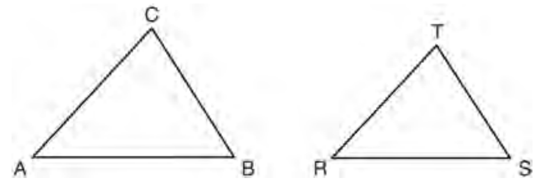


What is the length of $\overline{AB}$?
1 28
2 2
3 14
4 4

646 In the diagram below, $\triangle ABC \sim \triangle DEF$, $DE = 4$, $AB = x$, $AC = x + 2$, and $DF = x + 6$. Determine the length of $\overline{AB}$. [Only an algebraic solution can receive full credit.]



647 In the diagram below, $\triangle ABC \sim \triangle RST$.



Which statement is *not* true?
1 $\angle A \cong \angle R$
2 $\frac{AB}{RS} = \frac{BC}{ST}$
3 $\frac{AB}{BC} = \frac{ST}{RS}$
4 $\frac{AB + BC + AC}{RS + ST + RT} = \frac{AB}{RS}$

648 Scalene triangle *ABC* is similar to triangle *DEF*. Which statement is *false*?
1 $AB:BC = DE:EF$
2 $AC:DF = BC:EF$
3 $\angle ACB \cong \angle DFE$
4 $\angle ABC \cong \angle EDF$

649 Triangle *ABC* is similar to triangle *DEF*. The lengths of the sides of $\triangle ABC$ are 5, 8, and 11. What is the length of the shortest side of $\triangle DEF$ if its perimeter is 60?
1 10
2 12.5
3 20
4 27.5

650 If $\triangle RST \sim \triangle ABC$, $m\angle A = x^2 - 8x$, $m\angle C = 4x - 5$, and $m\angle R = 5x + 30$, find $m\angle C$. [Only an algebraic solution can receive full credit.]

651 The sides of a triangle measure 7, 4, and 9. If the longest side of a similar triangle measures 36, determine and state the length of the shortest side of this triangle.

652 The sides of a triangle are 8, 12, and 15. The longest side of a similar triangle is 18. What is the ratio of the perimeter of the smaller triangle to the perimeter of the larger triangle?

1 2:3
2 4:9
3 5:6
4 25:36

653 Triangle RST is similar to $\triangle XYZ$ with $RS = 3$ inches and $XY = 2$ inches. If the area of $\triangle RST$ is 27 square inches, determine and state the area of $\triangle XYZ$, in square inches.

654 If $\triangle ABC \sim \triangle LMN$, which statement is *not* always true?

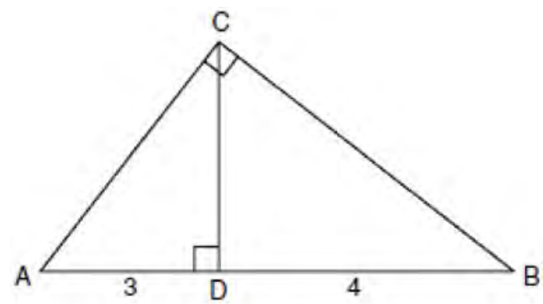
1 $m\angle A \cong m\angle N$
2 $m\angle B \cong m\angle M$
3 $\dfrac{\text{area of } \triangle ABC}{\text{area of } \triangle LMN} = \dfrac{(AC)^2}{(LN)^2}$
4 $\dfrac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle LMN} = \dfrac{AB}{LM}$

655 The corresponding medians of two similar triangles are 8 and 20. If the perimeter of the larger triangle is 45, what is the perimeter of the smaller triangle?

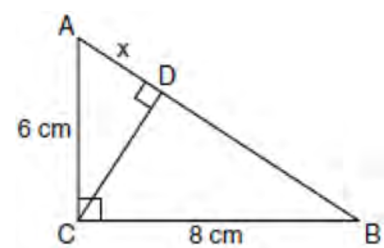
1 14
2 18
3 33
4 37

G.G.47: SIMILARITY

656 In the diagram below of right triangle ACB, altitude $\overline{CD}$ intersects $\overline{AB}$ at D. If $AD = 3$ and $DB = 4$, find the length of $\overline{CD}$ in simplest radical form.



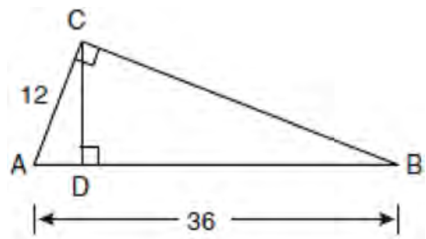
657 In the diagram below, the length of the legs $\overline{AC}$ and $\overline{BC}$ of right triangle ABC are 6 cm and 8 cm, respectively. Altitude $\overline{CD}$ is drawn to the hypotenuse of $\triangle ABC$.



What is the length of $\overline{AD}$ to the *nearest tenth of a centimeter*?

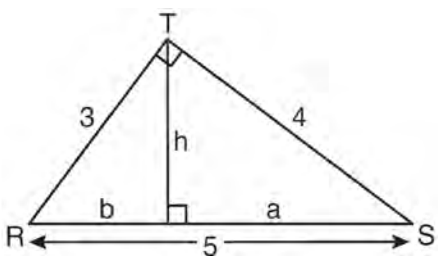
1 3.6
2 6.0
3 6.4
4 4.0

658 In the diagram below of right triangle *ACB*, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.

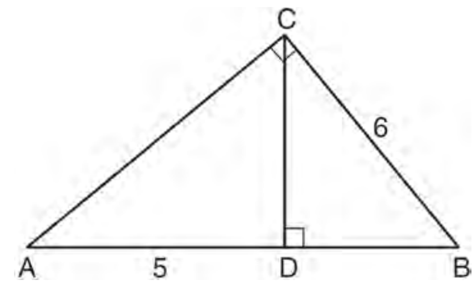


If *AB* = 36 and *AC* = 12, what is the length of $\overline{AD}$?
1 32
2 6
3 3
4 4

659 In the diagram below, $\triangle RST$ is a 3 – 4 – 5 right triangle. The altitude, *h*, to the hypotenuse has been drawn. Determine the length of *h*.

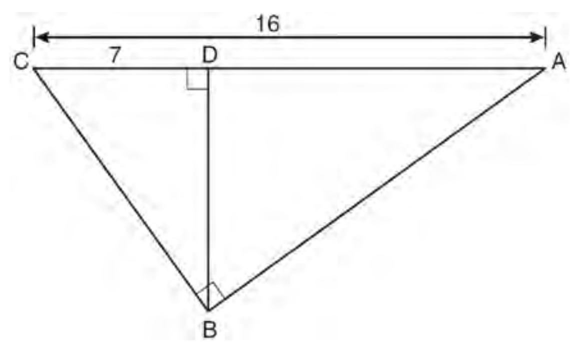


660 In the diagram below of right triangle *ABC*, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, *CB* = 6, and *AD* = 5.



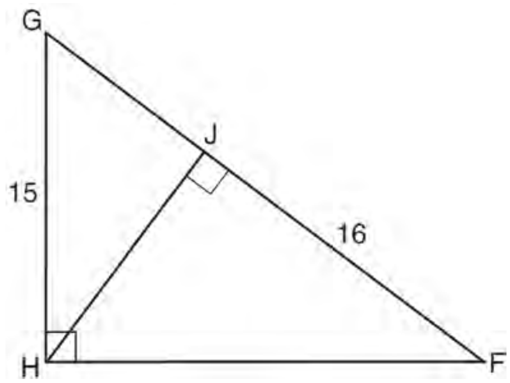
What is the length of $\overline{BD}$?
1 5
2 9
3 3
4 4

661 In the diagram below of right triangle *ABC*, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, *AC* = 16, and *CD* = 7.



What is the length of $\overline{BD}$?
1 $3\sqrt{7}$
2 $4\sqrt{7}$
3 $7\sqrt{3}$
4 12

662 In right triangle FGH shown below, $m\angle GHF = 90$, altitude $\overline{HJ}$ is drawn to $\overline{FG}$, $FJ = 16$, and $HG = 15$.

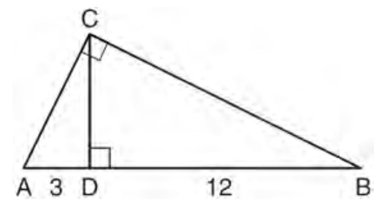


Determine and state the length of $\overline{JG}$. Determine and state the length of $\overline{HJ}$. [Only algebraic solutions can receive full credit.]

663 In $\triangle PQR$, $\angle PRQ$ is a right angle and $\overline{RT}$ is drawn perpendicular to hypotenuse $\overline{PQ}$. If $PT = x$, $RT = 6$, and $TQ = 4x$, what is the length of $\overline{PQ}$?

1 9
2 12
3 3
4 15

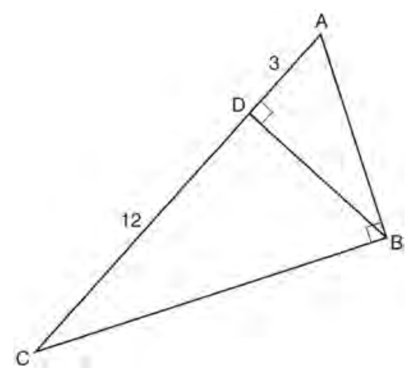
664 In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?

1 6
2 $6\sqrt{5}$
3 3
4 $3\sqrt{5}$

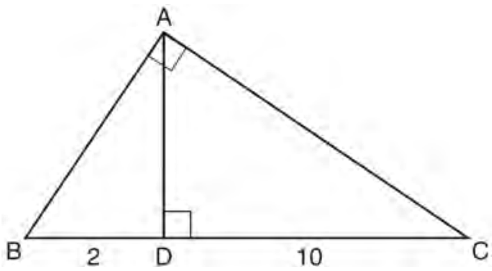
665 In right triangle ABC shown in the diagram below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $CD = 12$, and $AD = 3$.



What is the length of $\overline{AB}$?

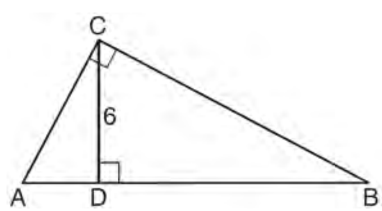
1 $5\sqrt{3}$
2 6
3 $3\sqrt{5}$
4 9

666 Triangle ABC shown below is a right triangle with altitude $\overline{AD}$ drawn to the hypotenuse $\overline{BC}$.

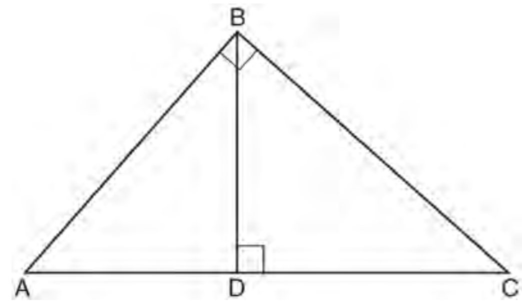


If $BD = 2$ and $DC = 10$, what is the length of $\overline{AB}$?
1 $2\sqrt{2}$
2 $2\sqrt{5}$
3 $2\sqrt{6}$
4 $2\sqrt{30}$

667 In right triangle ABC below, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If $CD = 6$ and the ratio of AD to AB is 1:5, determine and state the length of $\overline{BD}$. [Only an algebraic solution can receive full credit.]

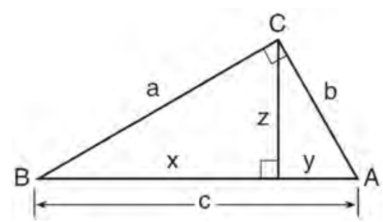


668 In right triangle ABC shown below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.



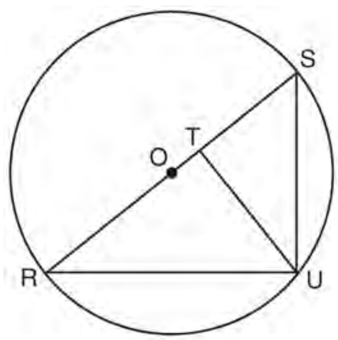
If $AD = 8$ and $DC = 10$, determine and state the length of $\overline{AB}$.

669 In the diagram below of right triangle ABC, an altitude is drawn to the hypotenuse $\overline{AB}$.

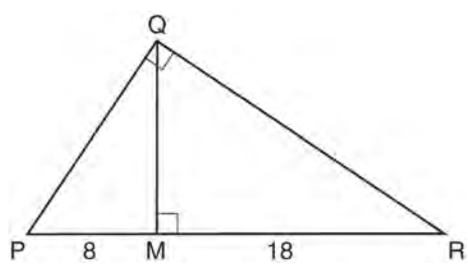


Which proportion would always represent a correct relationship of the segments?
1 $\frac{c}{z} = \frac{z}{y}$
2 $\frac{c}{a} = \frac{a}{y}$
3 $\frac{x}{z} = \frac{z}{y}$
4 $\frac{y}{b} = \frac{b}{x}$

670 In the diagram below, right triangle RSU is inscribed in circle O, and $\overline{UT}$ is the altitude drawn to hypotenuse $\overline{RS}$. The length of $\overline{RT}$ is 16 more than the length of $\overline{TS}$ and $TU = 15$. Find the length of $\overline{TS}$. Find, in simplest radical form, the length of $\overline{RU}$.

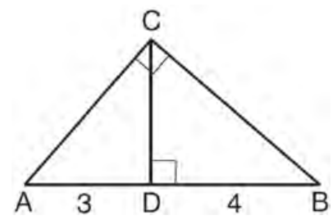


671 In the diagram below, $\overline{QM}$ is an altitude of right triangle PQR, $PM = 8$, and $RM = 18$.



What is the length of $\overline{QM}$?
1 20
2 16
3 12
4 10

672 In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $AD = 3$, and $DB = 4$.

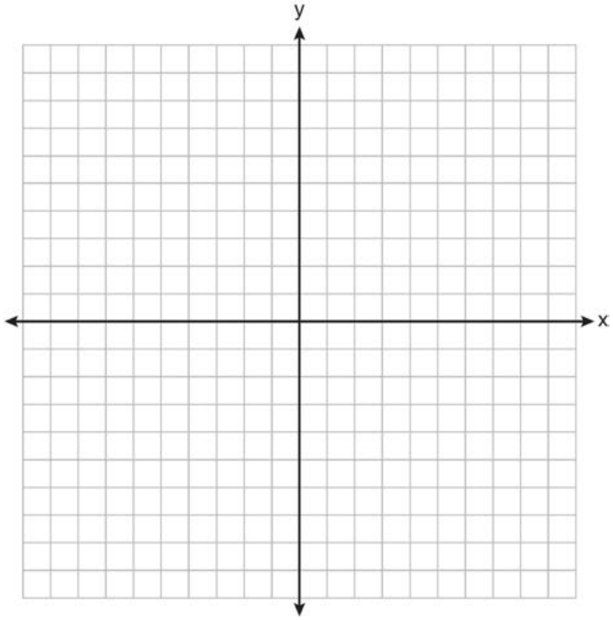


What is the length of $\overline{CB}$?
1 $2\sqrt{3}$
2 $\sqrt{21}$
3 $2\sqrt{7}$
4 $4\sqrt{3}$

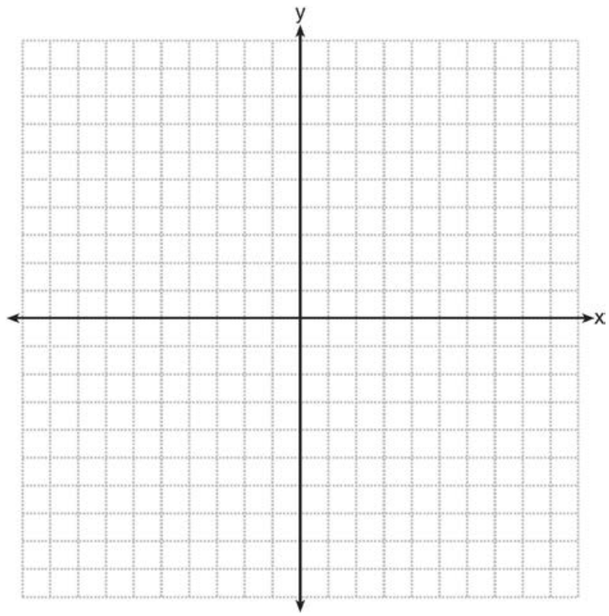
TRANSFORMATIONS

G.G.54: ROTATIONS

673 The coordinates of the vertices of $\triangle RST$ are $R(-2,3)$, $S(4,4)$, and $T(2,-2)$. Triangle $R'S'T'$ is the image of $\triangle RST$ after a rotation of 90° about the origin. State the coordinates of the vertices of $\triangle R'S'T'$. [The use of the set of axes below is optional.]



674 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-4,3)$, and $C(-3,-5)$. State the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a rotation of 90º about the origin. [The use of the set of axes below is optional.]



675 What are the coordinates of A', the image of $A(-3,4)$, after a rotation of 180º about the origin?
1 $(4,-3)$
2 $(-4,-3)$
3 $(3,4)$
4 $(3,-4)$

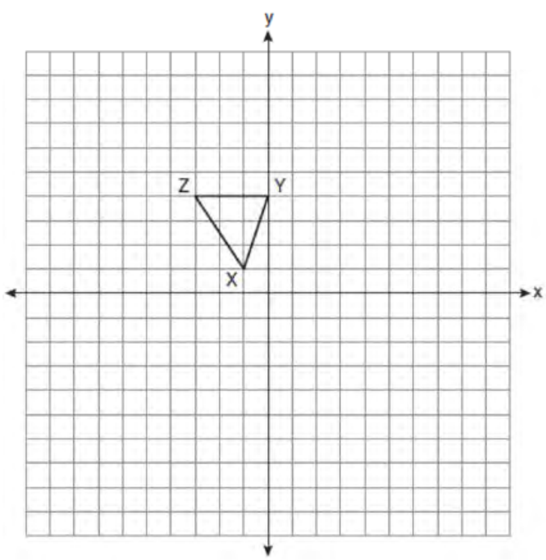
676 The coordinates of point P are $(7,1)$. What are the coordinates of the image of P after R_{90° about the origin?
1 $(1,7)$
2 $(-7,-1)$
3 $(1,-7)$
4 $(-1,7)$

677 The coordinates of the endpoints of $\overline{BC}$ are $B(5,1)$ and $C(-3,-2)$. Under the transformation R_{90}, the image of $\overline{BC}$ is $\overline{B'C'}$. State the coordinates of points B' and C'.

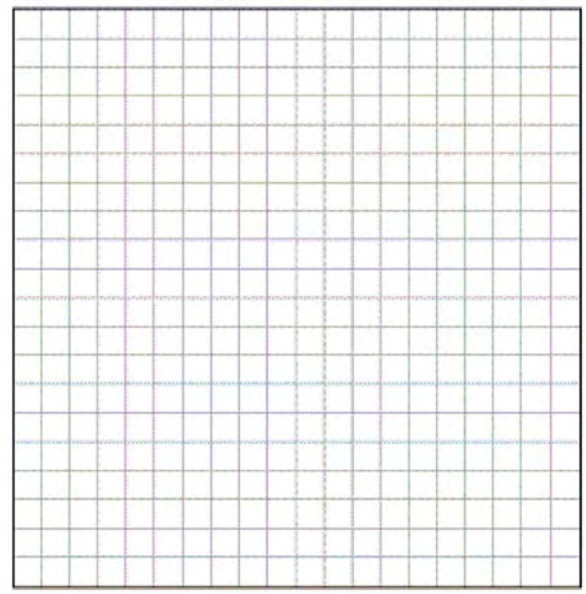
G.G.54: REFLECTIONS

678 Point A is located at $(4,-7)$. The point is reflected in the x-axis. Its image is located at
1 $(-4,7)$
2 $(-4,-7)$
3 $(4,7)$
4 $(7,-4)$

679 Triangle XYZ, shown in the diagram below, is reflected over the line $x = 2$. State the coordinates of $\triangle X'Y'Z'$, the image of $\triangle XYZ$.



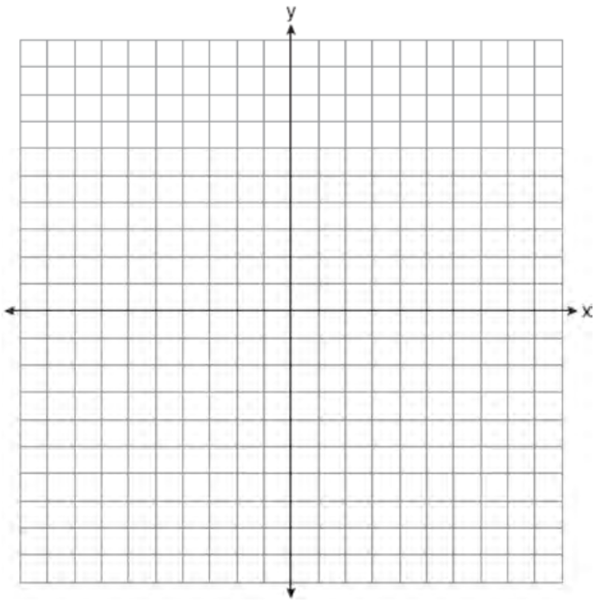
680 Triangle ABC has vertices $A(-2,2)$, $B(-1,-3)$, and $C(4,0)$. Find the coordinates of the vertices of $\triangle A'B'C'$, the image of $\triangle ABC$ after the transformation $r_{x\text{-axis}}$. [The use of the grid is optional.]



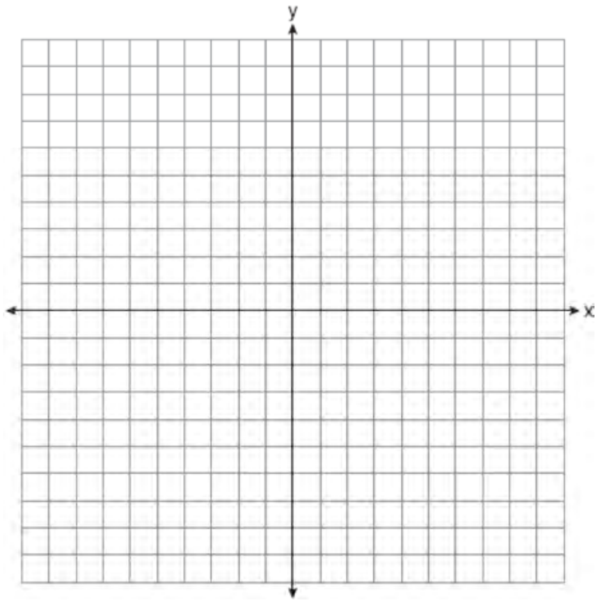
681 What is the image of the point $(2,-3)$ after the transformation $r_{y-\text{axis}}$?
1 $(2,3)$
2 $(-2,-3)$
3 $(-2,3)$
4 $(-3,2)$

682 The coordinates of point A are $(-3a,4b)$. If point A' is the image of point A reflected over the line $y = x$, the coordinates of A' are
1 $(4b,-3a)$
2 $(3a,4b)$
3 $(-3a,-4b)$
4 $(-4b,-3a)$

683 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$. [The use of the set of axes below is optional.]



684 The image of $\overline{RS}$ after a reflection through the origin is $\overline{R'S'}$. If the coordinates of the endpoints of $\overline{RS}$ are $R(2,-3)$ and $S(5,1)$, state and label the coordinates of R' and S'. [The use of the set of axes below is optional.]



G.G.54: TRANSLATIONS

685 Triangle ABC has vertices $A(1,3)$, $B(0,1)$, and $C(4,0)$. Under a translation, A', the image point of A, is located at $(4,4)$. Under this same translation, point C' is located at
1 $(7,1)$
2 $(5,3)$
3 $(3,2)$
4 $(1,-1)$

686 What is the image of the point $(-5,2)$ under the translation $T_{3,-4}$?
1 $(-9,5)$
2 $(-8,6)$
3 $(-2,-2)$
4 $(-15,-8)$

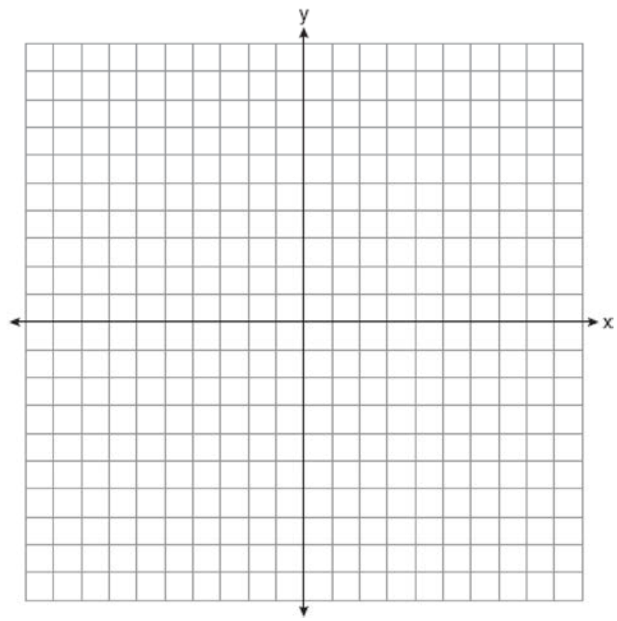
687 When the transformation $T_{2,-1}$ is performed on point A, its image is point $A'(-3,4)$. What are the coordinates of A?
1 $(5,-5)$
2 $(-5,5)$
3 $(-1,3)$
4 $(-6,-4)$

688 The image of $\triangle ABC$ under a translation is $\triangle A'B'C'$. Under this translation, $B(3,-2)$ maps onto $B'(1,-1)$. Using this translation, the coordinates of image A' are $(-2,2)$. Determine and state the coordinates of point A.

G.G.58: DILATIONS

689 Triangle ABC has vertices $A(6,6)$, $B(9,0)$, and $C(3,-3)$. State and label the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of $D_{\frac{1}{3}}$.

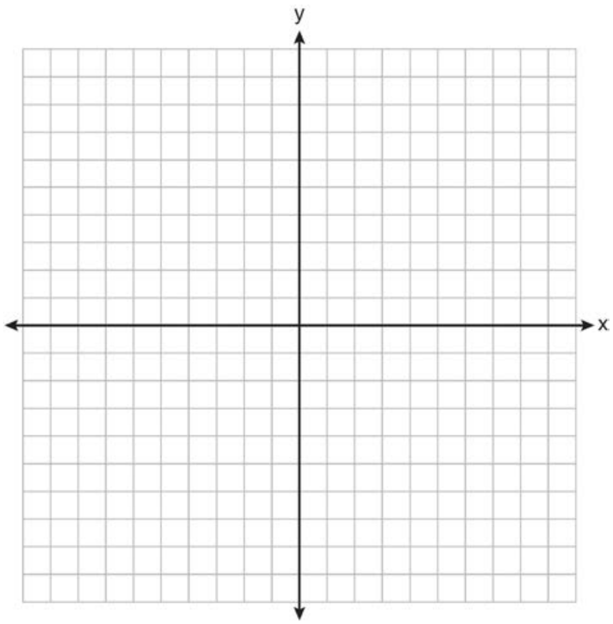
690 Triangle ABC has coordinates $A(-2,1)$, $B(3,1)$, and $C(0,-3)$. On the set of axes below, graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of 2.



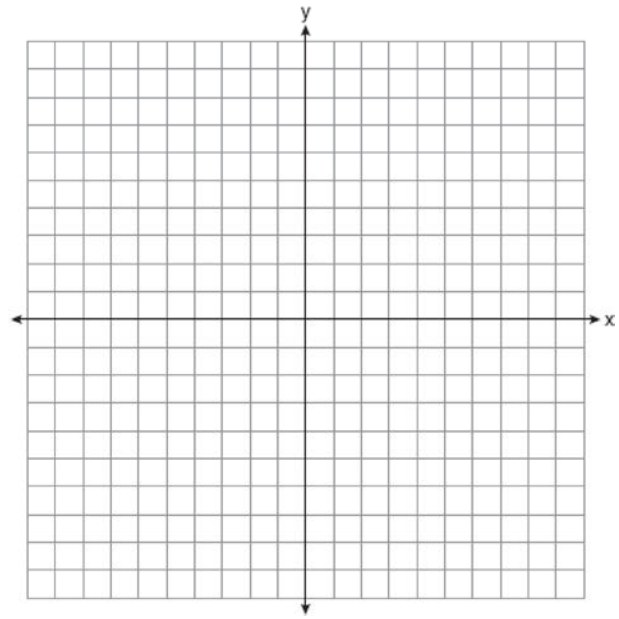
691 Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation of 2. Which statement is true?
1 $AB = A'B'$
2 $BC = 2(B'C')$
3 $m\angle B = m\angle B'$
4 $m\angle A = \frac{1}{2}(m\angle A')$

G.G.54: COMPOSITIONS OF TRANSFORMATIONS

692 The coordinates of the vertices of parallelogram $ABCD$ are $A(-2,2)$, $B(3,5)$, $C(4,2)$, and $D(-1,-1)$. State the coordinates of the vertices of parallelogram $A''B''C''D''$ that result from the transformation $r_{y-\text{axis}} \circ T_{2,-3}$. [The use of the set of axes below is optional.]



693 Triangle ABC has coordinates $A(6,-4)$, $B(0,2)$, and $C(6,2)$. On the set of axes below, graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of $\frac{1}{2}$.



694 What is the image of point $A(4,2)$ after the composition of transformations defined by $R_{90^\circ} \circ r_{y=x}$?

1 $(-4,2)$
2 $(4,-2)$
3 $(-4,-2)$
4 $(2,-4)$

695 The point $(3,-2)$ is rotated 90º about the origin and then dilated by a scale factor of 4. What are the coordinates of the resulting image?

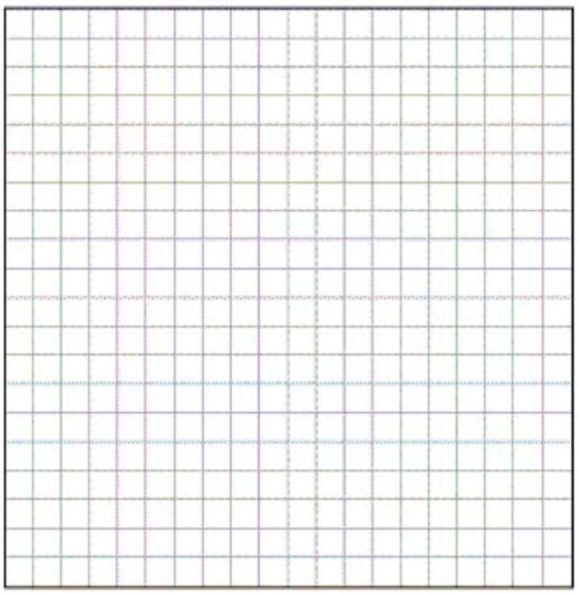
1 $(-12,8)$
2 (12,-8)
3 $(8,12)$
4 $(-8,-12)$

G.G.58: COMPOSITIONS OF TRANSFORMATIONS

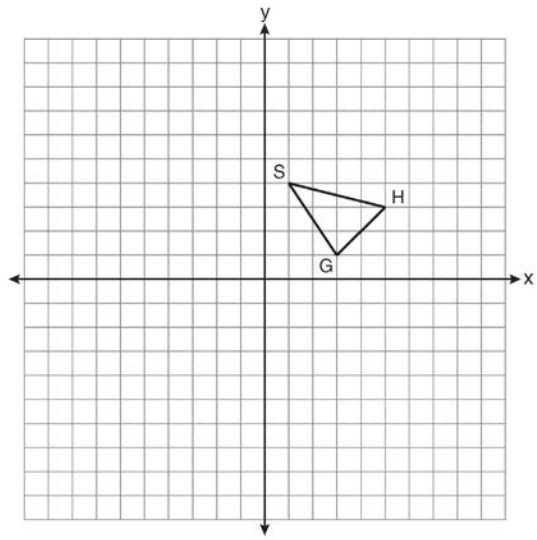
696 The endpoints of $\overline{AB}$ are $A(3,2)$ and $B(7,1)$. If $\overline{A''B''}$ is the result of the transformation of $\overline{AB}$ under $D_2 \circ T_{-4,3}$ what are the coordinates of A'' and B''?

1 $A''(-2,10)$ and $B''(6,8)$
2 $A''(-1,5)$ and $B''(3,4)$
3 $A''(2,7)$ and $B''(10,5)$
4 $A''(14,-2)$ and $B''(22,-4)$

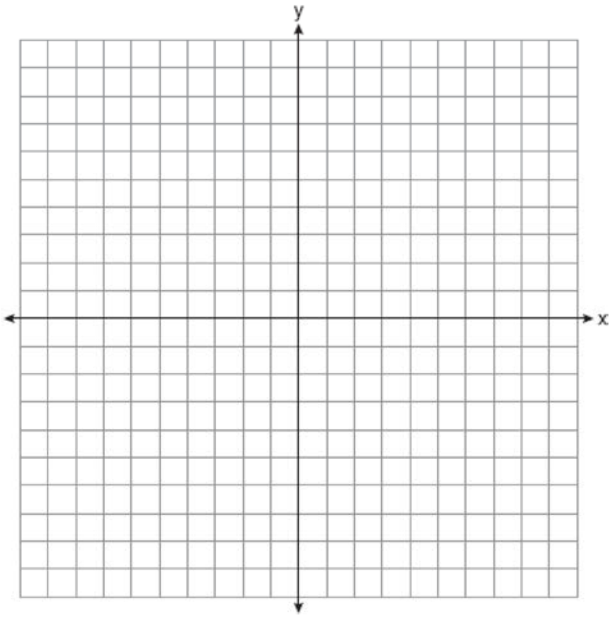
697 The coordinates of the vertices of $\triangle ABC$ $A(1,3)$, $B(-2,2)$ and $C(0,-2)$. On the grid below, graph and label $\triangle A''B''C''$, the result of the composite transformation $D_2 \circ T_{3,-2}$. State the coordinates of A'', B'', and C''.



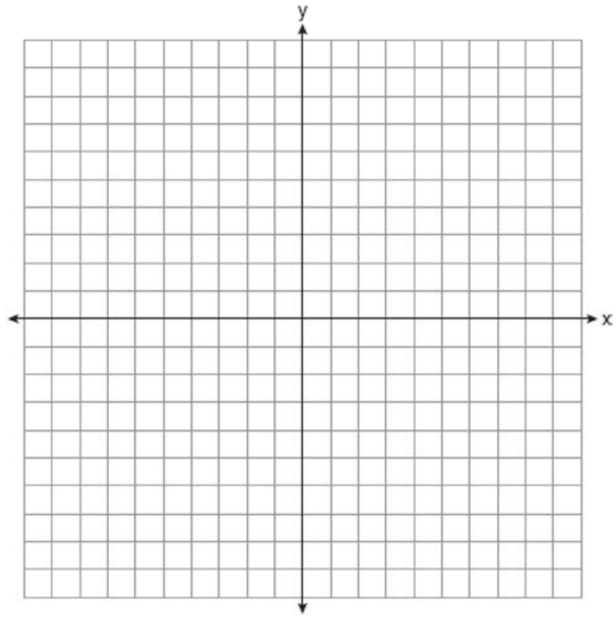
698 As shown on the set of axes below, $\triangle GHS$ has vertices $G(3,1)$, $H(5,3)$, and $S(1,4)$. Graph and state the coordinates of $\triangle G''H''S''$, the image of $\triangle GHS$ after the transformation $T_{-3,1} \circ D_2$.



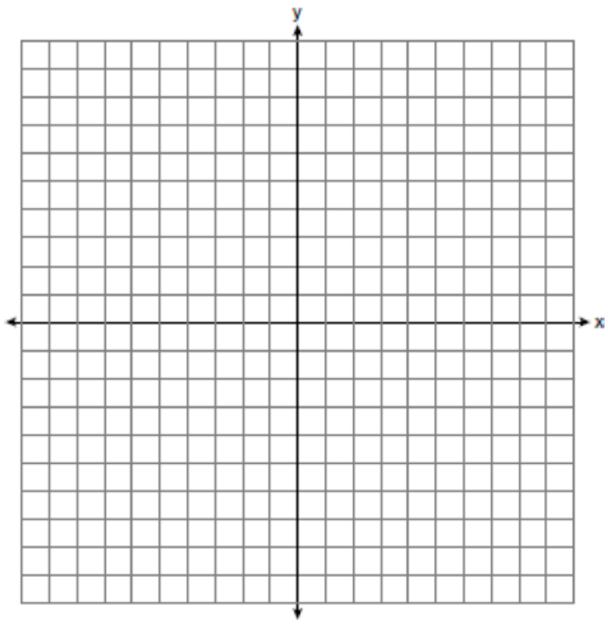
699 The coordinates of trapezoid $ABCD$ are $A(-4,5)$, $B(1,5)$, $C(1,2)$, and $D(-6,2)$. Trapezoid $A''B''C''D''$ is the image after the composition $r_{x-\text{axis}} \circ r_{y=x}$ is performed on trapezoid $ABCD$. State the coordinates of trapezoid $A''B''C''D''$. [The use of the set of axes below is optional.]



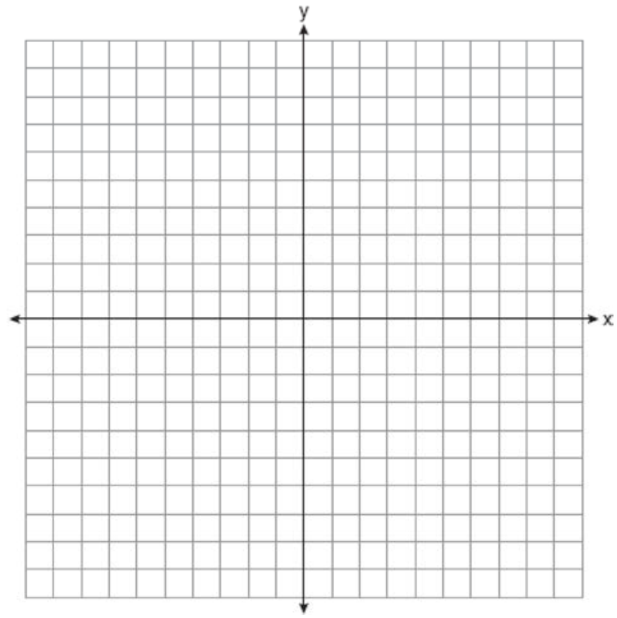
700 The vertices of $\triangle RST$ are $R(-6,5)$, $S(-7,-2)$, and $T(1,4)$. The image of $\triangle RST$ after the composition $T_{-2,3} \circ r_{y=x}$ is $\triangle R''S''T''$. State the coordinates of $\triangle R''S''T''$. [The use of the set of axes below is optional.]



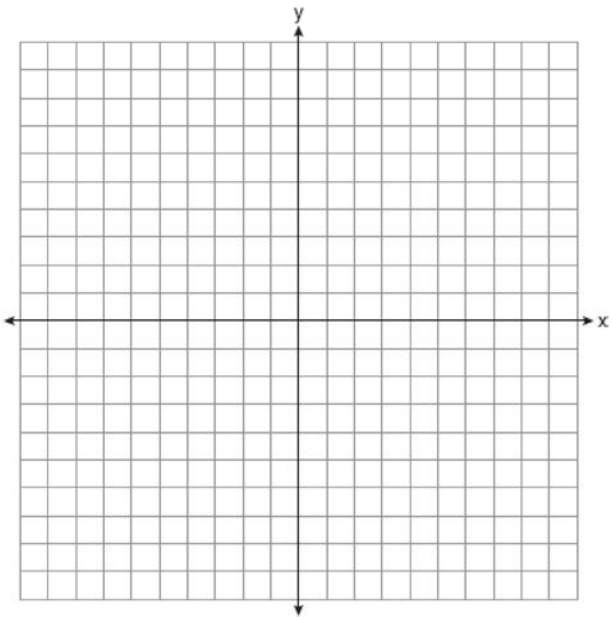
701 Triangle ABC has vertices $A(5,1)$, $B(1,4)$ and $C(1,1)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$, following the composite transformation $T_{1,-1} \circ D_2$. [The use of the set of axes below is optional.]



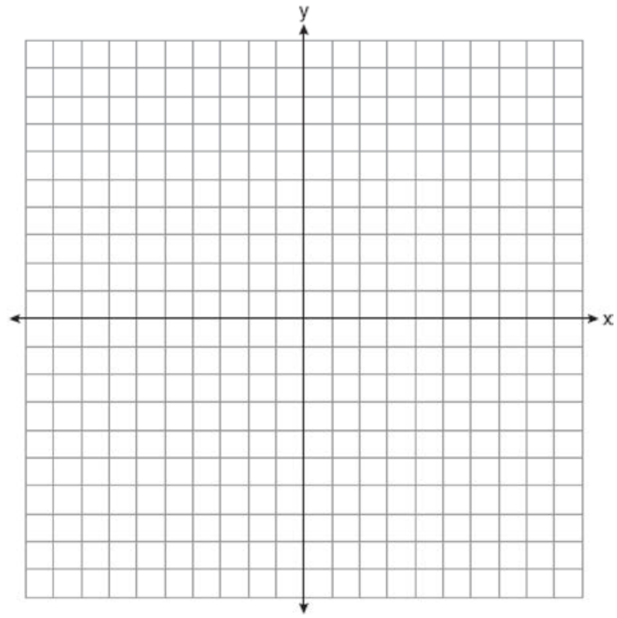
702 The coordinates of the vertices of parallelogram $SWAN$ are $S(2,-2)$, $W(-2,-4)$, $A(-4,6)$, and $N(0,8)$. State and label the coordinates of parallelogram $S''W''A''N''$, the image of $SWAN$ after the transformation $T_{4,-2} \circ D_{\frac{1}{2}}$. [The use of the set of axes below is optional.]



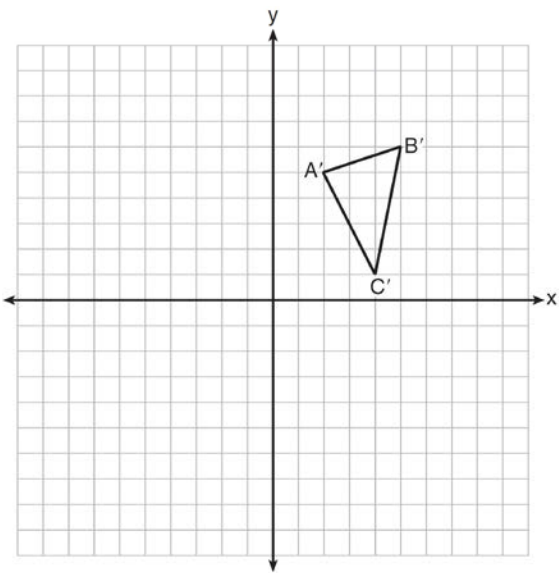
703 Quadrilateral *MATH* has coordinates $M(-6,-3)$, $A(-1,-3)$, $T(-2,-1)$, and $H(-4,-1)$. The image of quadrilateral *MATH* after the composition $r_{x\text{-axis}} \circ T_{7,5}$ is quadrilateral $M''A''T''H''$. State and label the coordinates of $M''A''T''H''$. [The use of the set of axes below is optional.]



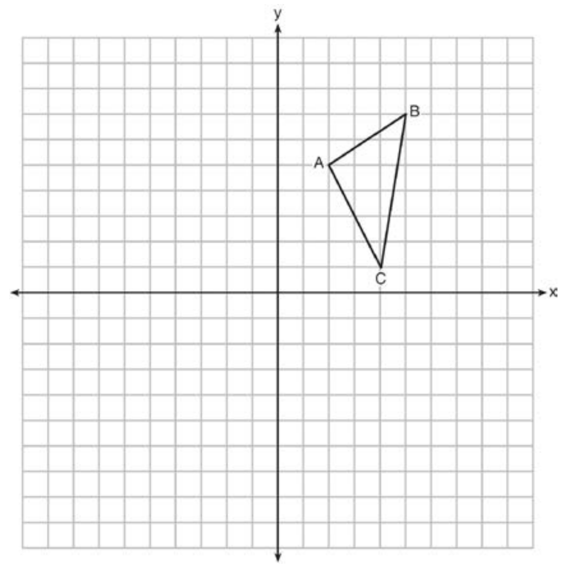
704 The coordinates of the vertices of $\triangle ABC$ are $A(-6,5)$, $B(-4,8)$, and $C(1,6)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$ after the composition of transformations $T_{(4,-5)} \circ r_{y\text{-axis}}$. [The use of the set of axes below is optional.]



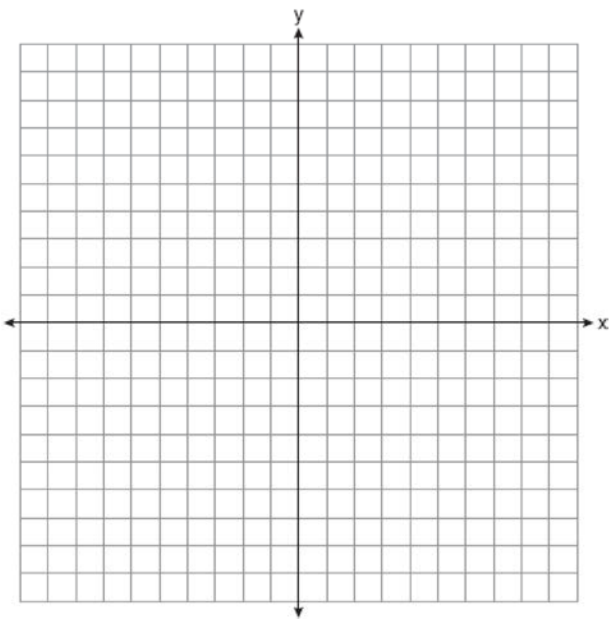
705 The graph below shows $\triangle A'B'C'$, the image of $\triangle ABC$ after it was reflected over the y-axis. Graph and label $\triangle ABC$, the pre-image of $\triangle A'B'C'$. Graph and label $\triangle A''B''C''$, the image of $\triangle A'B'C'$ after it is reflected through the origin. State a single transformation that will map $\triangle ABC$ onto $\triangle A''B''C''$.



706 The coordinates of $\triangle ABC$, shown on the graph below, are $A(2,5)$, $B(5,7)$, and $C(4,1)$. Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after it is reflected over the y-axis. Graph and label $\triangle A''B''C''$, the image of $\triangle A'B'C'$ after it is reflected over the x-axis. State a single transformation that will map $\triangle ABC$ onto $\triangle A''B''C''$.

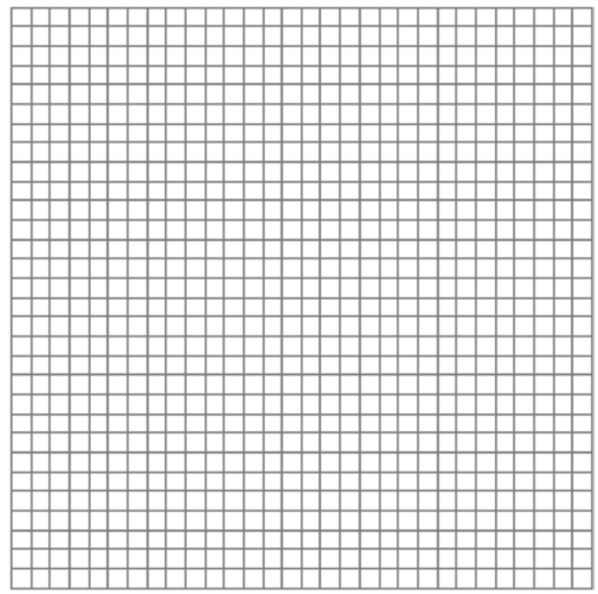


707 Quadrilateral *HYPE* has vertices $H(2,3)$, $Y(1,7)$, $P(-2,7)$, and $E(-2,4)$. State and label the coordinates of the vertices of $H''Y''P''E''$ after the composition of transformations $r_{x-axis} \circ T_{5,-3}$. [The use of the set of axes below is optional.]

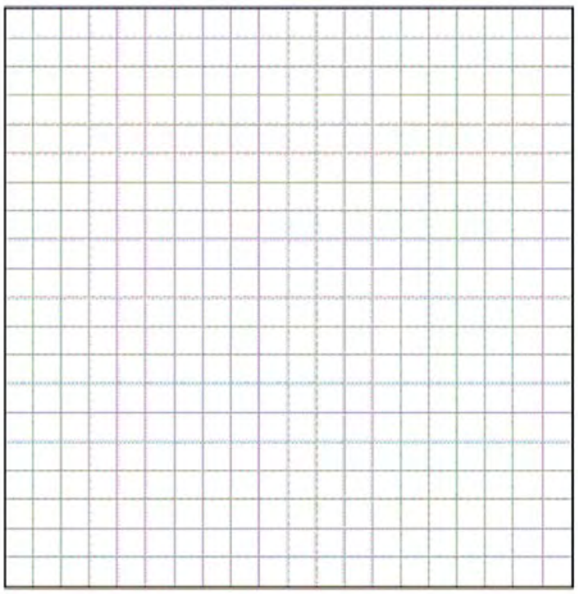


G.G.55: PROPERTIES OF TRANSFORMATIONS

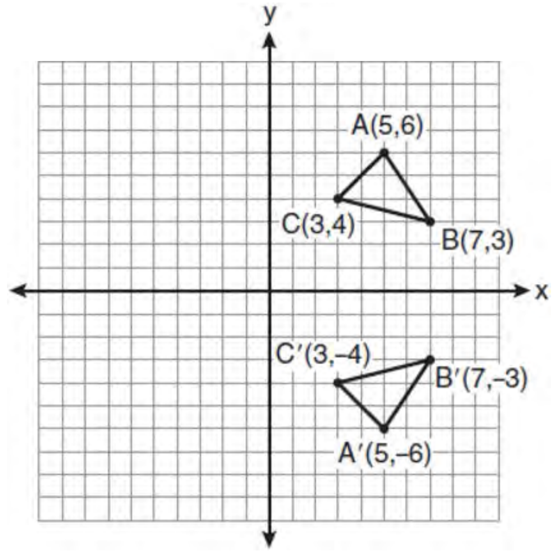
708 The vertices of $\triangle ABC$ are $A(3,2)$, $B(6,1)$, and $C(4,6)$. Identify and graph a transformation of $\triangle ABC$ such that its image, $\triangle A'B'C'$, results in $\overline{AB} \parallel \overline{A'B'}$.



709 Triangle *DEG* has the coordinates $D(1,1)$, $E(5,1)$, and $G(5,4)$. Triangle *DEG* is rotated 90° about the origin to form $\triangle D'E'G'$. On the grid below, graph and label $\triangle DEG$ and $\triangle D'E'G'$. State the coordinates of the vertices D', E', and G'. Justify that this transformation preserves distance.

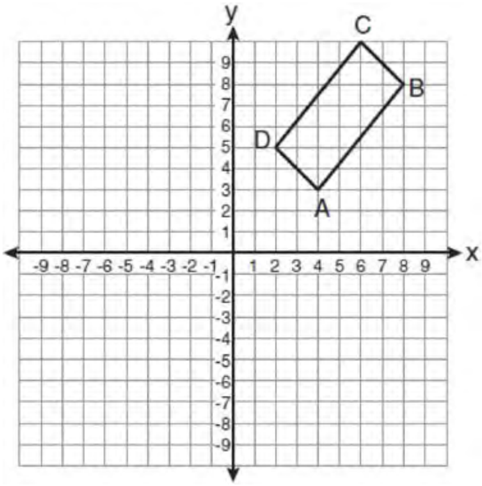


710 Which expression best describes the transformation shown in the diagram below?



1 same orientation; reflection
2 opposite orientation; reflection
3 same orientation; translation
4 opposite orientation; translation

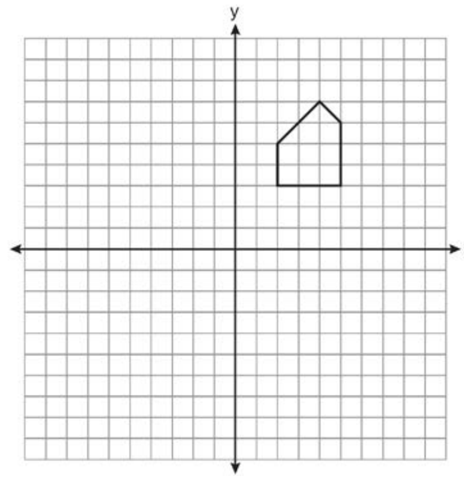
711 The rectangle *ABCD* shown in the diagram below will be reflected across the *x*-axis.



What will *not* be preserved?
1 slope of $\overline{AB}$
2 parallelism of $\overline{AB}$ and $\overline{CD}$
3 length of $\overline{AB}$
4 measure of $\angle A$

712 Quadrilateral *MNOP* is a trapezoid with $\overline{MN} \parallel \overline{OP}$. If $M'N'O'P'$ is the image of *MNOP* after a reflection over the *x*-axis, which two sides of quadrilateral $M'N'O'P'$ are parallel?
1 $\overline{M'N'}$ and $\overline{O'P'}$
2 $\overline{M'N'}$ and $\overline{N'O'}$
3 $\overline{P'M'}$ and $\overline{O'P'}$
4 $\overline{P'M'}$ and $\overline{N'O'}$

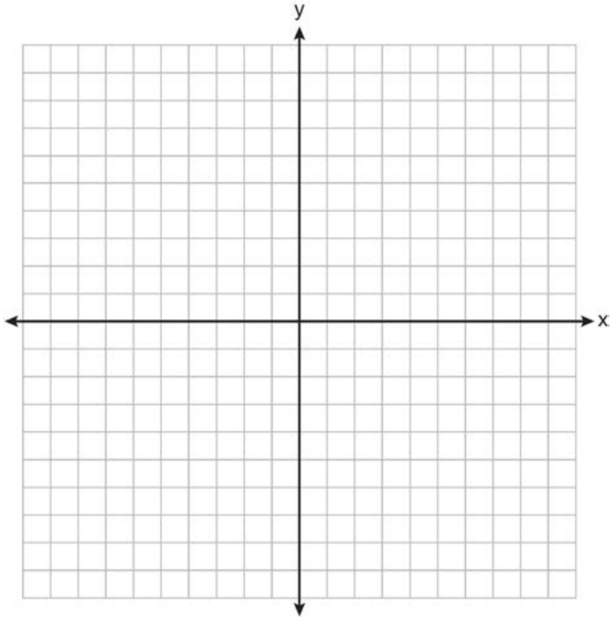
713 A pentagon is drawn on the set of axes below. If the pentagon is reflected over the *y*-axis, determine if this transformation is an isometry. Justify your answer. [The use of the set of axes is optional.]



714 Pentagon *PQRST* has $\overline{PQ}$ parallel to $\overline{TS}$. After a translation of $T_{2,-5}$, which line segment is parallel to $\overline{P'Q'}$?
1 $\overline{R'Q'}$
2 $\overline{R'S'}$
3 $\overline{T'S'}$
4 $\overline{T'P'}$

715 When a quadrilateral is reflected over the line $y = x$, which geometric relationship is *not* preserved?
1 congruence
2 orientation
3 parallelism
4 perpendicularity

716 Triangle ABC has coordinates $A(2,-2)$, $B(2,1)$, and $C(4,-2)$. Triangle $A'B'C'$ is the image of $\triangle ABC$ under $T_{5,-2}$. On the set of axes below, graph and label $\triangle ABC$ and its image, $\triangle A'B'C'$. Determine the relationship between the area of $\triangle ABC$ and the area of $\triangle A'B'C'$. Justify your response.

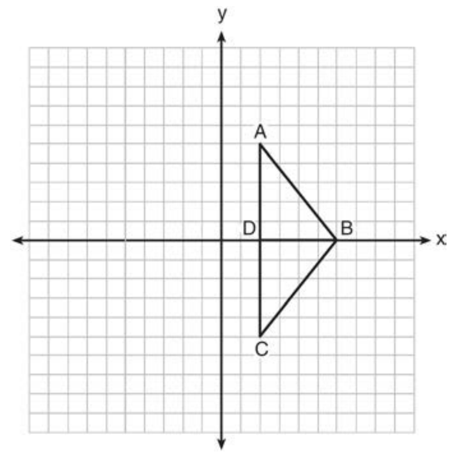


717 The vertices of parallelogram $ABCD$ are $A(2,0)$, $B(0,-3)$, $C(3,-3)$, and $D(5,0)$. If $ABCD$ is reflected over the x-axis, how many vertices remain invariant?
1 1
2 2
3 3
4 0

718 Triangle ABC has the coordinates $A(3,0)$, $B(3,8)$, and $C(6,6)$. If $\triangle ABC$ is reflected over the line $y=x$, which statement is true about the image of $\triangle ABC$?
1 One point remains fixed.
2 The size of the triangle changes.
3 The orientation does not change.
4 One side of $\triangle ABC$ is parallel to the line $y=x$.

719 After the transformation $r_{y=x}$, the image of $\triangle ABC$ is $\triangle A'B'C'$. If $AB = 2x+13$ and $A'B' = 9x-8$, find the value of x.

720 As shown in the diagram below, when right triangle DAB is reflected over the x-axis, its image is triangle DCB.

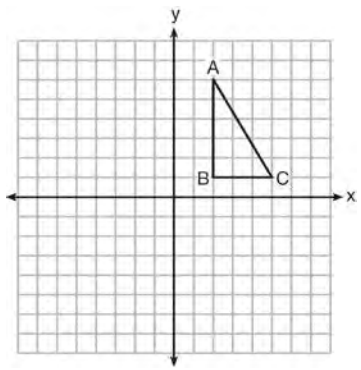


Which statement justifies why $\overline{AB} \cong \overline{CB}$?
1 Distance is preserved under reflection.
2 Orientation is preserved under reflection.
3 Points on the line of reflection remain invariant.
4 Right angles remain congruent under reflection.

721 Triangle ABC has the coordinates $A(1,2)$, $B(5,2)$, and $C(5,5)$. Triangle ABC is rotated 180° about the origin to form triangle $A'B'C'$. Triangle $A'B'C'$ is
1 acute
2 isosceles
3 obtuse
4 right

722 The image of rhombus $VWXY$ preserves which properties under the transformation $T_{2,-3}$?
1 parallelism, only
2 orientation, only
3 both parallelism and orientation
4 neither parallelism nor orientation

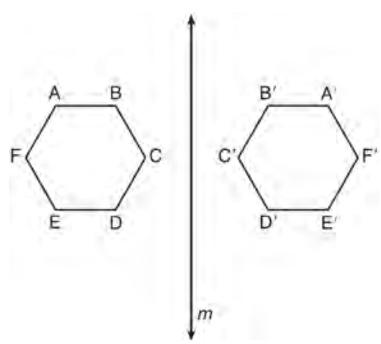
723 Right triangle ABC is shown in the graph below.



After a reflection over the y-axis, the image of $\triangle ABC$ is $\triangle A'B'C'$. Which statement is *not* true?

1 $\overline{BC} \cong \overline{B'C'}$
2 $\overline{A'B'} \perp \overline{B'C'}$
3 $AB = A'B'$
4 $\overline{AC} \parallel \overline{A'C'}$

724 As shown in the diagram below, when hexagon $ABCDEF$ is reflected over line m, the image is hexagon $A'B'C'D'E'F'$.



Under this transformation, which property is *not* preserved?

1 area
2 distance
3 orientation
4 angle measure

725 If $\triangle W'X'Y'$ is the image of $\triangle WXY$ after the transformation R_{90°, which statement is *false*?

1 $XY = X'Y'$
2 $\overline{WX} \parallel \overline{W'X'}$
3 $\triangle WXY \cong \triangle W'X'Y'$
4 $m\angle XWY = m\angle X'W'Y'$

726 The image of $\triangle ABC$ after the transformation $r_{y-\text{axis}}$ is $\triangle A'B'C'$. Which property is *not* preserved?

1 distance
2 orientation
3 collinearity
4 angle measure

G.G.57: PROPERTIES OF TRANSFORMATIONS

727 Which transformation of the line $x = 3$ results in an image that is perpendicular to the given line?

1 $r_{x\text{-axis}}$
2 $r_{y\text{-axis}}$
3 $r_{y=x}$
4 $r_{x=1}$

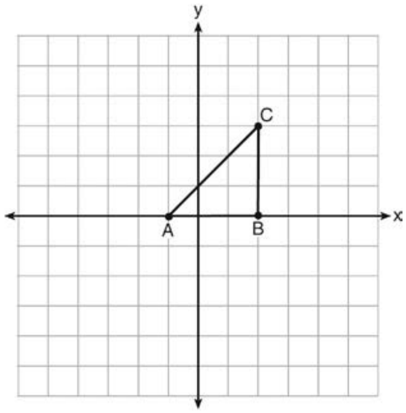
G.G.59: PROPERTIES OF TRANSFORMATIONS

728 In $\triangle KLM$, $m\angle K = 36$ and $KM = 5$. The transformation D_2 is performed on $\triangle KLM$ to form $\triangle K'L'M'$. Find $m\angle K'$. Justify your answer. Find the length of $\overline{K'M'}$. Justify your answer.

729 When $\triangle ABC$ is dilated by a scale factor of 2, its image is $\triangle A'B'C'$. Which statement is true?

1 $\overline{AC} \cong \overline{A'C'}$
2 $\angle A \cong \angle A'$
3 perimeter of $\triangle ABC$ = perimeter of $\triangle A'B'C'$
4 2(area of $\triangle ABC$) = area of $\triangle A'B'C'$

730 Triangle ABC is graphed on the set of axes below.



Which transformation produces an image that is similar to, but *not* congruent to, $\triangle ABC$?

1 $T_{2,3}$
2 D_2
3 $r_{y=x}$
4 R_{90}

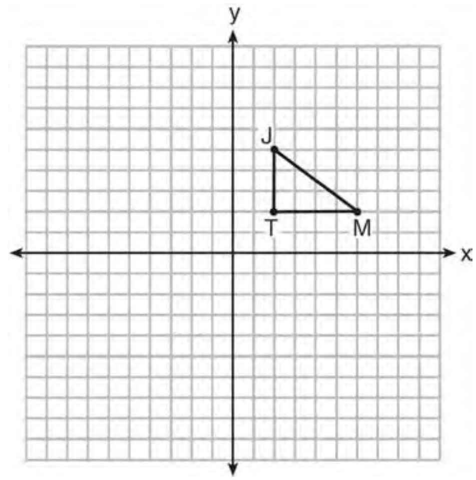
731 When a dilation is performed on a hexagon, which property of the hexagon will *not* be preserved in its image?

1 parallelism
2 orientation
3 length of sides
4 measure of angles

732 If $\triangle ABC$ and its image, $\triangle A'B'C'$, are graphed on a set of axes, $\triangle ABC \cong \triangle A'B'C'$ under each transformation *except*

1 D_2
2 R_{90°
3 $r_{y=x}$
4 $T_{(-2,3)}$

733 Triangle JTM is shown on the graph below.

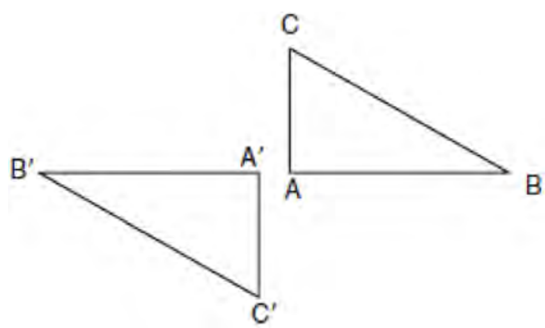


Which transformation would result in an image that is *not* congruent to $\triangle JTM$?

1 $r_{y=x}$
2 R_{90°
3 $T_{0,-3}$
4 D_2

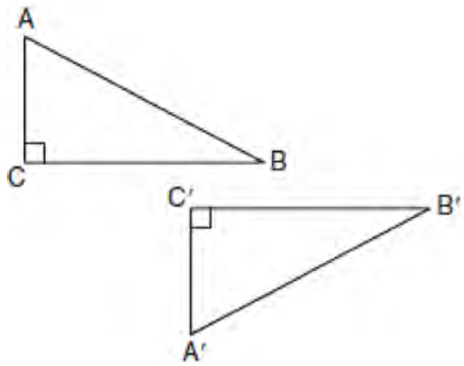
<u>G.G.56: IDENTIFYING TRANSFORMATIONS</u>

734 In the diagram below, under which transformation will $\triangle A'B'C'$ be the image of $\triangle ABC$?



1 rotation
2 dilation
3 translation
4 glide reflection

735 In the diagram below, which transformation was used to map $\triangle ABC$ to $\triangle A'B'C'$?

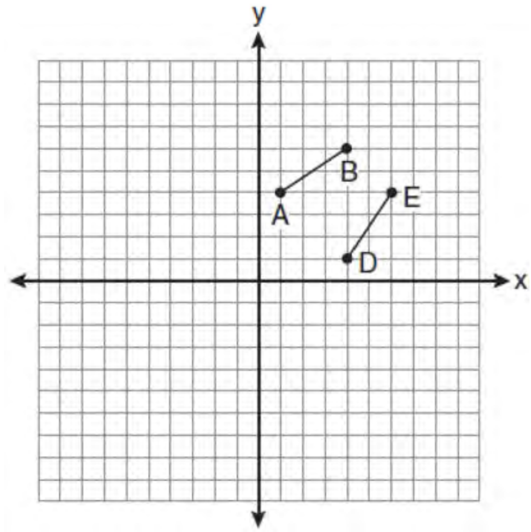


1 dilation
2 rotation
3 reflection
4 glide reflection

736 Which transformation is *not* always an isometry?
1 rotation
2 dilation
3 reflection
4 translation

737 Which transformation can map the letter S onto itself?
1 glide reflection
2 translation
3 line reflection
4 rotation

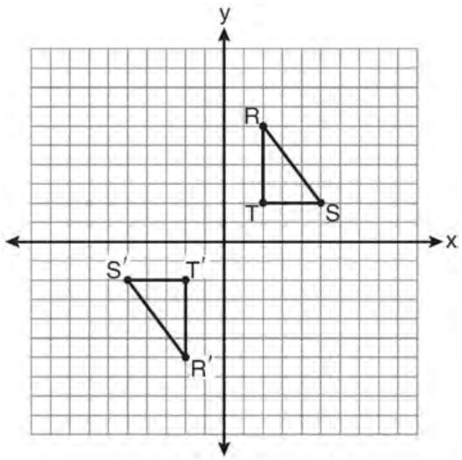
738 The diagram below shows $\overline{AB}$ and $\overline{DE}$.



Which transformation will move $\overline{AB}$ onto $\overline{DE}$ such that point D is the image of point A and point E is the image of point B?
1 $T_{3,-3}$
2 $D_{\frac{1}{2}}$
3 R_{90°
4 $r_{y=x}$

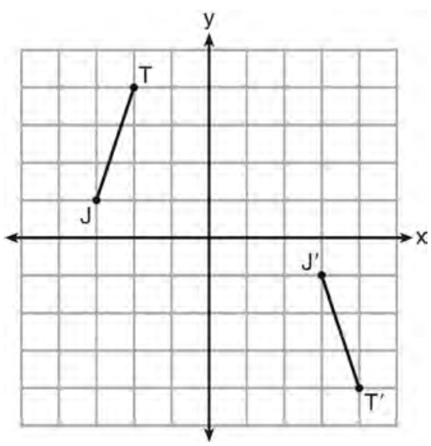
739 A transformation of a polygon that always preserves both length and orientation is
1 dilation
2 translation
3 line reflection
4 glide reflection

740 As shown on the graph below, $\triangle R'S'T'$ is the image of $\triangle RST$ under a single transformation.



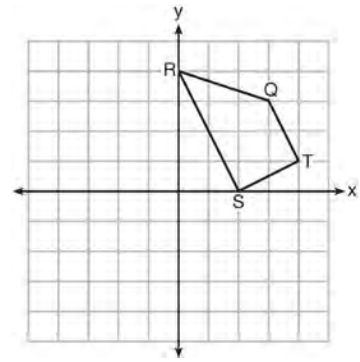
Which transformation does this graph represent?
1 glide reflection
2 line reflection
3 rotation
4 translation

741 The graph below shows $\overline{JT}$ and its image, $\overline{J'T'}$, after a transformation.



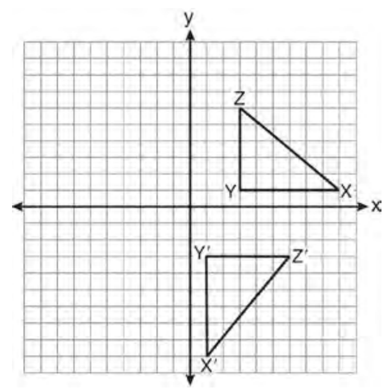
Which transformation would map $\overline{JT}$ onto $\overline{J'T'}$?
1 translation
2 glide reflection
3 rotation centered at the origin
4 reflection through the origin

742 Trapezoid *QRST* is graphed on the set of axes below.



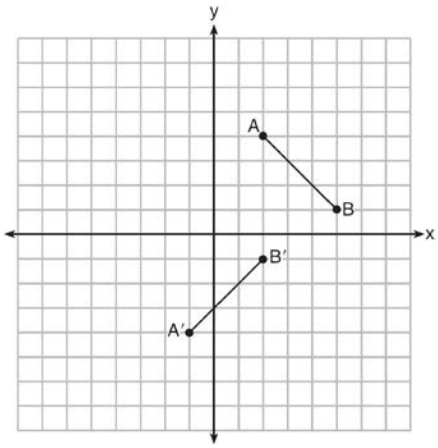
Under which transformation will there be *no* invariant points?
1 $r_{y=0}$
2 $r_{x=0}$
3 $r_{(0,0)}$
4 $r_{y=x}$

743 In the diagram below, under which transformation is $\triangle X'Y'Z'$ the image of $\triangle XYZ$?



1 dilation
2 reflection
3 rotation
4 translation

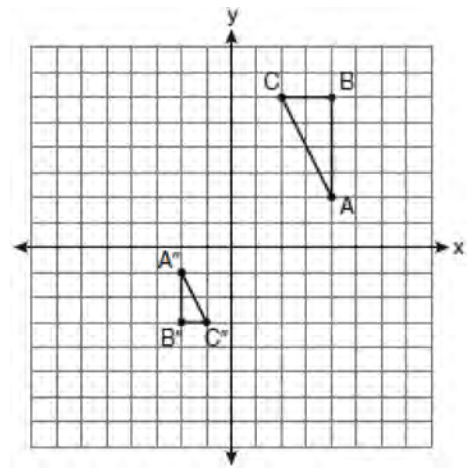
744 In the diagram below, $\overline{A'B'}$ is the image of $\overline{AB}$ under which single transformation?



1 dilation
2 rotation
3 translation
4 glide reflection

G.G.60: IDENTIFYING TRANSFORMATIONS

745 After a composition of transformations, the coordinates $A(4,2)$, $B(4,6)$, and $C(2,6)$ become $A''(-2,-1)$, $B''(-2,-3)$, and $C''(-1,-3)$, as shown on the set of axes below.

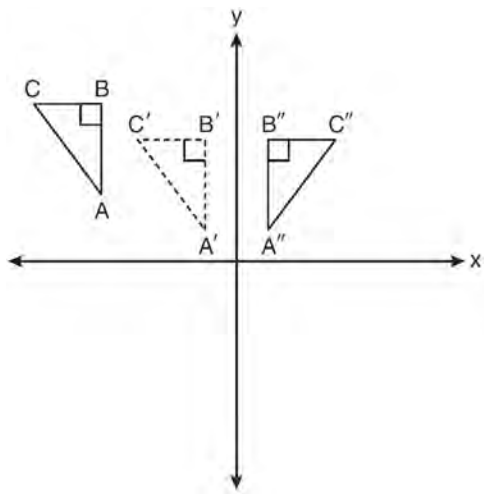


Which composition of transformations was used?
1 $R_{180^\circ} \circ D_2$
2 $R_{90^\circ} \circ D_2$
3 $D_{\frac{1}{2}} \circ R_{180^\circ}$
4 $D_{\frac{1}{2}} \circ R_{90^\circ}$

746 Which transformation produces a figure similar but not congruent to the original figure?
1 $T_{1,3}$
2 $D_{\frac{1}{2}}$
3 R_{90°
4 $r_{y=x}$

Geometry Regents Exam Questions by Performance Indicator: Topic

747 In the diagram below, $\triangle A'B'C'$ is a transformation of $\triangle ABC$, and $\triangle A''B''C''$ is a transformation of $\triangle A'B'C'$.

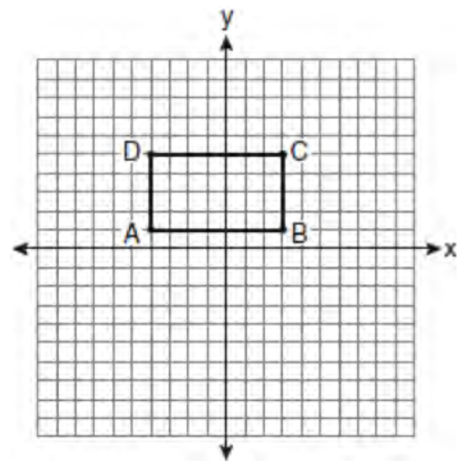


The composite transformation of $\triangle ABC$ to $\triangle A''B''C''$ is an example of a
1 reflection followed by a rotation
2 reflection followed by a translation
3 translation followed by a rotation
4 translation followed by a reflection

G.G.61: ANALYTICAL REPRESENTATIONS OF TRANSFORMATIONS

748 A polygon is transformed according to the rule: $(x,y) \rightarrow (x+2,y)$. Every point of the polygon moves two units in which direction?
1 up
2 down
3 left
4 right

749 On the set of axes below, Geoff drew rectangle *ABCD*. He will transform the rectangle by using the translation $(x,y) \rightarrow (x+2,y+1)$ and then will reflect the translated rectangle over the *x*-axis.

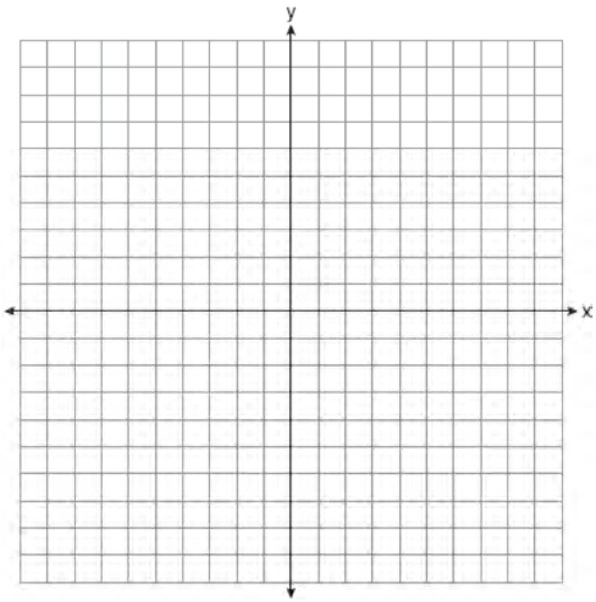


What will be the area of the rectangle after these transformations?
1 exactly 28 square units
2 less than 28 square units
3 greater than 28 square units
4 It cannot be determined from the information given.

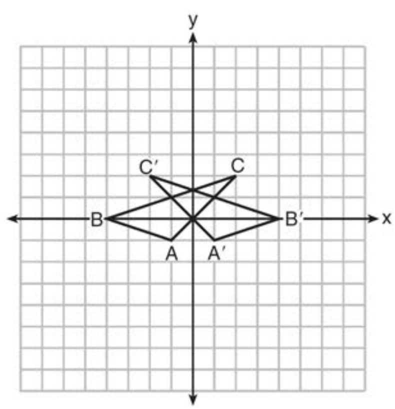
750 Quadrilateral *ABCD* undergoes a transformation, producing quadrilateral $A'B'C'D'$. For which transformation would the area of $A'B'C'D'$ *not* be equal to the area of *ABCD*?
1 a rotation of 90° about the origin
2 a reflection over the *y*-axis
3 a dilation by a scale factor of 2
4 a translation defined by $(x,y) \rightarrow (x+4,y-1)$

751 What are the coordinates of the image of point $A(2,-7)$ under the translation $(x,y) \rightarrow (x-3,y+5)$?
1 $(-1,-2)$
2 $(-1,2)$
3 $(5,-12)$
4 $(5,12)$

752 Triangle TAP has coordinates $T(-1,4)$, $A(2,4)$, and $P(2,0)$. On the set of axes below, graph and label $\triangle T'A'P'$, the image of $\triangle TAP$ after the translation $(x,y) \rightarrow (x-5,y-1)$.



753 In the diagram below, under which transformation is $\triangle A'B'C'$ the image of $\triangle ABC$?



1 D_2
2 $r_{x\text{-axis}}$
3 $r_{y\text{-axis}}$
4 $(x,y) \rightarrow (x-2,y)$

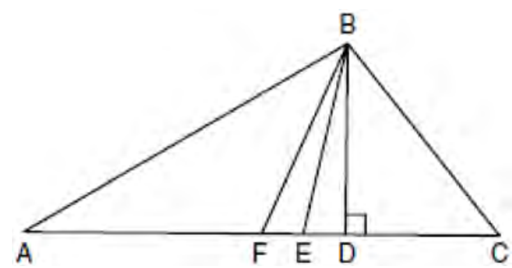
754 What are the coordinates of P', the image of point $P(x,y)$ after translation $T_{4,4}$?
1 $(x-4,y-4)$
2 $(x+4,y+4)$
3 $(4x,4y)$
4 $(4,4)$

LOGIC

G.G.24: STATEMENTS AND NEGATIONS

755 What is the negation of the statement "The Sun is shining"?
1 It is cloudy.
2 It is daytime.
3 It is not raining.
4 The Sun is not shining.

756 Given $\triangle ABC$ with base $\overline{AFEDC}$, median $\overline{BF}$, altitude $\overline{BD}$, and $\overline{BE}$ bisects $\angle ABC$, which conclusion is valid?



1 $\angle FAB \cong \angle ABF$
2 $\angle ABF \cong \angle CBD$
3 $\overline{CE} \cong \overline{EA}$
4 $\overline{CF} \cong \overline{FA}$

757 What is the negation of the statement "Squares are parallelograms"?
1 Parallelograms are squares.
2 Parallelograms are not squares.
3 It is not the case that squares are parallelograms.
4 It is not the case that parallelograms are squares.

758 What is the negation of the statement “I am not going to eat ice cream”?
1 I like ice cream.
2 I am going to eat ice cream.
3 If I eat ice cream, then I like ice cream.
4 If I don’t like ice cream, then I don’t eat ice cream.

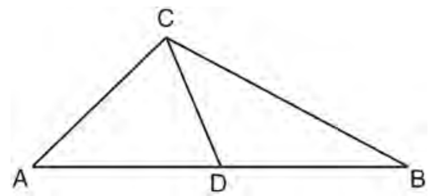
759 Given the true statement, "The medians of a triangle are concurrent," write the negation of the statement and give the truth value for the negation.

760 Which statement is the negation of “Two is a prime number” and what is the truth value of the negation?
1 Two is not a prime number; false
2 Two is not a prime number; true
3 A prime number is two; false
4 A prime number is two; true

761 A student wrote the sentence “4 is an odd integer.” What is the negation of this sentence and the truth value of the negation?
1 3 is an odd integer; true
2 4 is not an odd integer; true
3 4 is not an even integer; false
4 4 is an even integer; false

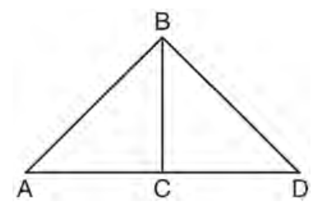
762 Write the negation of the statement “2 is a prime number,” and determine the truth value of the negation.

763 As shown in the diagram below, $\overline{CD}$ is a median of $\triangle ABC$.



Which statement is *always* true?
1 $\overline{AD} \cong \overline{DB}$
2 $\overline{AC} \cong \overline{AD}$
3 $\angle ACD \cong \angle CDB$
4 $\angle BCD \cong \angle ACD$

764 Given: $\triangle ABD$, $\overline{BC}$ is the perpendicular bisector of $\overline{AD}$

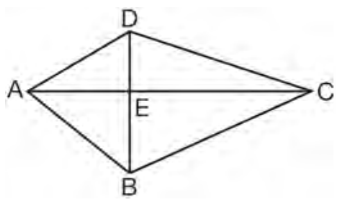


Which statement can *not* always be proven?
1 $\overline{AC} \cong \overline{DC}$
2 $\overline{BC} \cong \overline{CD}$
3 $\angle ACB \cong \angle DCB$
4 $\triangle ABC \cong \triangle DBC$

765 Given the statement: One is a prime number. What is the negation and the truth value of the negation?
1 One is not a prime number; true
2 One is not a prime number; false
3 One is a composite number; true
4 One is a composite number; false

766 What are the truth values of the statement "Two is prime" and its negation?
1 The statement is false and its negation is true.
2 The statement is false and its negation is false.
3 The statement is true and its negation is true.
4 The statement is true and its negation is false.

767 In the diagram below of quadrilateral $ABCD$, diagonals $\overline{AEC}$ and $\overline{BED}$ are perpendicular at E.



Which statement is always true based on the given information?
1 $\overline{DE} \cong \overline{EB}$
2 $\overline{AD} \cong \overline{AB}$
3 $\angle DAC \cong \angle BAC$
4 $\angle AED \cong \angle CED$

768 What are the truth values of the statement "Opposite angles of a trapezoid are always congruent" and its negation?
1 The statement is true and its negation is true.
2 The statement is true and its negation is false.
3 The statement is false and its negation is true.
4 The statement is false and its negation is false.

G.G.25: COMPOUND STATEMENTS

769 Given: Two is an even integer or three is an even integer.
Determine the truth value of this disjunction.
Justify your answer.

770 Which compound statement is true?
1 A triangle has three sides and a quadrilateral has five sides.
2 A triangle has three sides if and only if a quadrilateral has five sides.
3 If a triangle has three sides, then a quadrilateral has five sides.
4 A triangle has three sides or a quadrilateral has five sides.

771 The statement "x is a multiple of 3, and x is an even integer" is true when x is equal to
1 9
2 8
3 3
4 6

772 Which statement has the same truth value as the statement "If a quadrilateral is a square, then it is a rectangle"?
1 If a quadrilateral is a rectangle, then it is a square.
2 If a quadrilateral is a rectangle, then it is not a square.
3 If a quadrilateral is not a square, then it is not a rectangle.
4 If a quadrilateral is not a rectangle, then it is not a square.

773 Which compound statement is true?
1 A square has four sides or a hexagon has eight sides.
2 A square has four sides and a hexagon has eight sides.
3 If a square has four sides, then a hexagon has eight sides.
4 A square has four sides if and only if a hexagon has eight sides.

774 The statement "$x > 5$ or $x < 3$" is *false* when x is equal to
1 1
2 2
3 7
4 4

G.G.26: CONDITIONAL STATEMENTS

775 Write a statement that is logically equivalent to the statement “If two sides of a triangle are congruent, the angles opposite those sides are congruent.” Identify the new statement as the converse, inverse, or contrapositive of the original statement.

776 What is the contrapositive of the statement, “If I am tall, then I will bump my head”?
1 If I bump my head, then I am tall.
2 If I do not bump my head, then I am tall.
3 If I am tall, then I will not bump my head.
4 If I do not bump my head, then I am not tall.

777 What is the inverse of the statement “If two triangles are not similar, their corresponding angles are not congruent”?
1 If two triangles are similar, their corresponding angles are not congruent.
2 If corresponding angles of two triangles are not congruent, the triangles are not similar.
3 If two triangles are similar, their corresponding angles are congruent.
4 If corresponding angles of two triangles are congruent, the triangles are similar.

778 The converse of the statement “If a triangle has one right angle, the triangle has two acute angles” is
1 If a triangle has two acute angles, the triangle has one right angle.
2 If a triangle has one right angle, the triangle does not have two acute angles.
3 If a triangle does not have one right angle, the triangle does not have two acute angles.
4 If a triangle does not have two acute angles, the triangle does not have one right angle.

779 What is the converse of the statement "If Bob does his homework, then George gets candy"?
1 If George gets candy, then Bob does his homework.
2 Bob does his homework if and only if George gets candy.
3 If George does not get candy, then Bob does not do his homework.
4 If Bob does not do his homework, then George does not get candy.

780 Which statement is logically equivalent to "If it is warm, then I go swimming"
1 If I go swimming, then it is warm.
2 If it is warm, then I do not go swimming.
3 If I do not go swimming, then it is not warm.
4 If it is not warm, then I do not go swimming.

781 Consider the relationship between the two statements below.

If $\sqrt{16+9} \neq 4+3$, then $5 \neq 4+3$

If $\sqrt{16+9} = 4+3$, then $5 = 4+3$

These statements are
1 inverses
2 converses
3 contrapositives
4 biconditionals

782 What is the converse of "If an angle measures 90 degrees, then it is a right angle"?
1 If an angle is a right angle, then it measures 90 degrees.
2 An angle is a right angle if it measures 90 degrees.
3 If an angle is not a right angle, then it does not measure 90 degrees.
4 If an angle does not measure 90 degrees, then it is not a right angle.

783 Lines *m* and *n* are in plane $\mathcal{A}$. What is the converse of the statement "If lines *m* and *n* are parallel, then lines *m* and *n* do not intersect"?
1 If lines *m* and *n* are not parallel, then lines *m* and *n* intersect.
2 If lines *m* and *n* are not parallel, then lines *m* and *n* do not intersect
3 If lines *m* and *n* intersect, then lines *m* and *n* are not parallel.
4 If lines *m* and *n* do not intersect, then lines *m* and *n* are parallel.

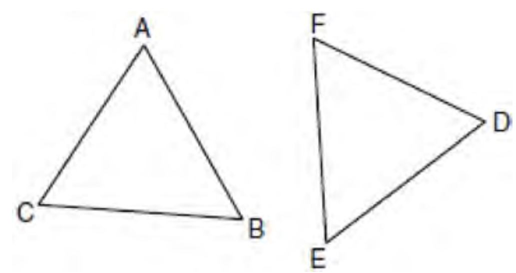
784 Given the statement, "If a number has exactly two factors, it is a prime number," what is the contrapositive of this statement?
1 If a number does not have exactly two factors, then it is not a prime number.
2 If a number is not a prime number, then it does not have exactly two factors.
3 If a number is a prime number, then it has exactly two factors.
4 A number is a prime number if it has exactly two factors.

785 Which statement is the inverse of "If $x+3=7$, then $x=4$"?
1 If $x=4$, then $x+3=7$.
2 If $x\neq 4$, then $x+3\neq 7$.
3 If $x+3\neq 7$, then $x\neq 4$.
4 If $x+3=7$, then $x\neq 4$.

786 Given: "If a polygon is a triangle, then the sum of its interior angles is 180°." What is the contrapositive of this statement?
1 "If the sum of the interior angles of a polygon is not 180°, then it is not a triangle."
2 "A polygon is a triangle if and only if the sum of its interior angles is 180°."
3 "If a polygon is not a triangle, then the sum of the interior angles is not 180°."
4 "If the sum of the interior angles of a polygon is 180°, then it is a triangle."

G.G.28: TRIANGLE CONGRUENCY

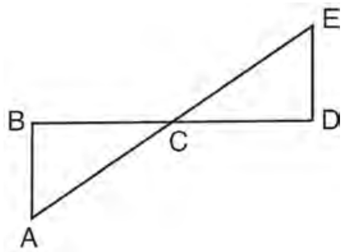
787 In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB}\cong\overline{DE}$, $\angle A\cong\angle D$, and $\angle B\cong\angle E$.



Which method can be used to prove $\triangle ABC\cong\triangle DEF$?
1 SSS
2 SAS
3 ASA
4 HL

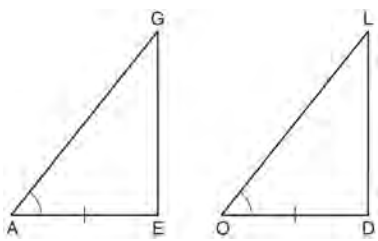
788 The diagonal $\overline{AC}$ is drawn in parallelogram *ABCD*. Which method can *not* be used to prove that $\triangle ABC\cong\triangle CDA$?
1 SSS
2 SAS
3 SSA
4 ASA

789 Given: $\overline{AE}$ bisects $\overline{BD}$ at C
$\overline{AB}$ and $\overline{DE}$ are drawn
$\angle ABC \cong \angle EDC$



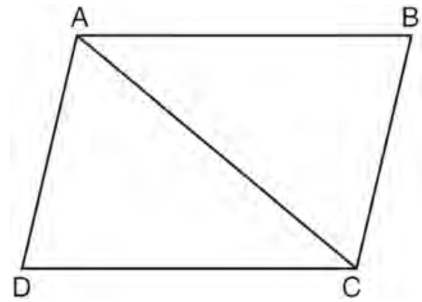
Which statement is needed to prove $\triangle ABC \cong \triangle EDC$ using ASA?
1 $\angle ABC$ and $\angle EDC$ are right angles.
2 $\overline{BD}$ bisects $\overline{AE}$ at C.
3 $\angle BCA \cong \angle DCE$
4 $\angle DEC \cong \angle BAC$

790 In the diagram below of $\triangle AGE$ and $\triangle OLD$, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.



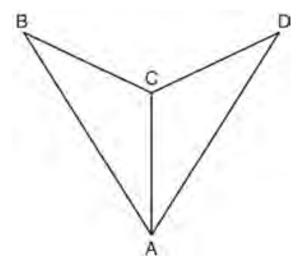
To prove that $\triangle AGE$ and $\triangle OLD$ are congruent by SAS, what other information is needed?
1 $\overline{GE} \cong \overline{LD}$
2 $\overline{AG} \cong \overline{OL}$
3 $\angle AGE \cong \angle OLD$
4 $\angle AEG \cong \angle ODL$

791 In the diagram of quadrilateral $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\angle ABC \cong \angle CDA$, and diagonal $\overline{AC}$ is drawn.



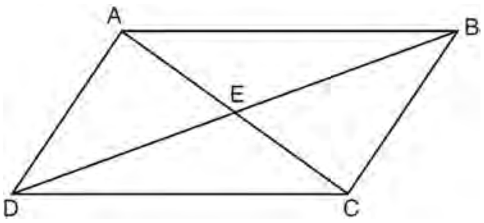
Which method can be used to prove $\triangle ABC$ is congruent to $\triangle CDA$?
1 AAS
2 SSA
3 SAS
4 SSS

792 As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.



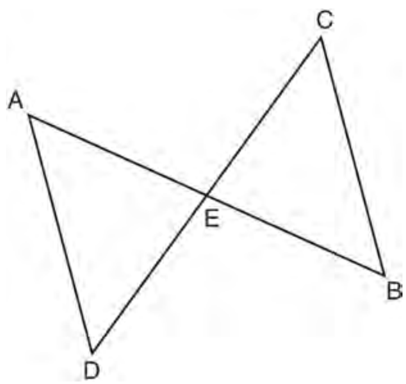
Which method could be used to prove $\triangle ABC \cong \triangle ADC$?
1 SSS
2 AAA
3 SAS
4 AAS

793 In parallelogram *ABCD* shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*.



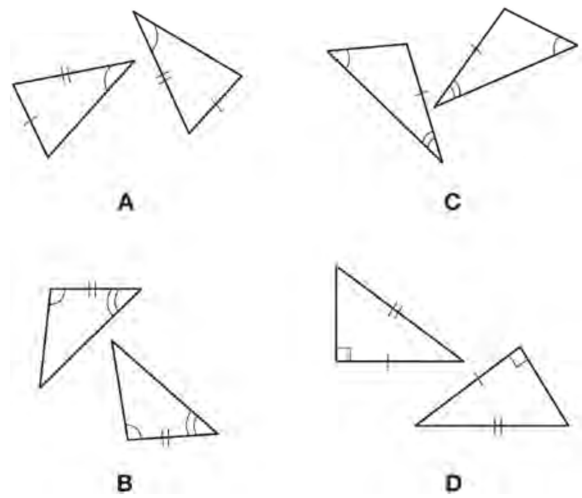
Which statement must be true?
1 $\overline{AC} \cong \overline{DB}$
2 $\angle ABD \cong \angle CBD$
3 $\triangle AED \cong \triangle CEB$
4 $\triangle DCE \cong \triangle BCE$

794 In the diagram below of $\triangle DAE$ and $\triangle BCE$, $\overline{AB}$ and $\overline{CD}$ intersect at *E*, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.



Triangle *DAE* can be proved congruent to triangle *BCE* by
1 ASA
2 SAS
3 SSS
4 HL

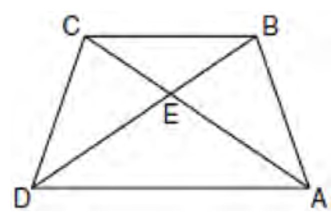
795 In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair.



Using only the information given in the diagrams, which pair of triangles can *not* be proven congruent?
1 *A*
2 *B*
3 *C*
4 *D*

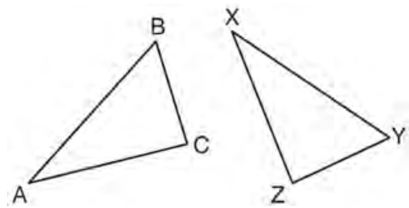
G.G.29: TRIANGLE CONGRUENCY

796 In the diagram of trapezoid *ABCD* below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E* and $\triangle ABC \cong \triangle DCB$.



Which statement is true based on the given information?
1 $\overline{AC} \cong \overline{BC}$
2 $\overline{CD} \cong \overline{AD}$
3 $\angle CDE \cong \angle BAD$
4 $\angle CDB \cong \angle BAC$

797 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which two statements identify corresponding congruent parts for these triangles?

1 $\overline{AB} \cong \overline{XY}$ and $\angle C \cong \angle Y$
2 $\overline{AB} \cong \overline{YZ}$ and $\angle C \cong \angle X$
3 $\overline{BC} \cong \overline{XY}$ and $\angle A \cong \angle Y$
4 $\overline{BC} \cong \overline{YZ}$ and $\angle A \cong \angle X$

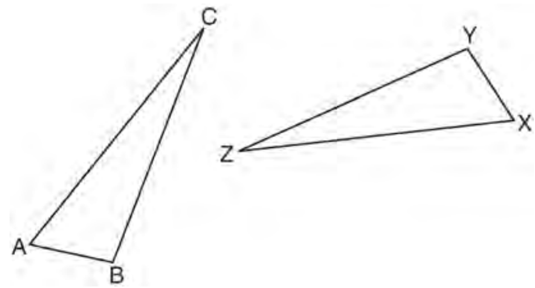
798 Which statement is *not* always true when $\triangle ABC \cong \triangle XYZ$.

1 $\overline{BC} \cong \overline{YZ}$
2 $\overline{CA} \cong \overline{XY}$
3 $\angle CAB \cong \angle ZXY$
4 $\angle BCA \cong \angle YZX$

799 If $\triangle JKL \cong \triangle MNO$, which statement is always true?

1 $\angle KLJ \cong \angle NMO$
2 $\angle KJL \cong \angle MON$
3 $\overline{JL} \cong \overline{MO}$
4 $\overline{JK} \cong \overline{ON}$

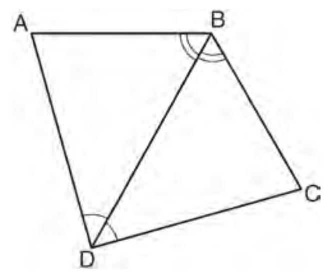
800 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which statement must be true?

1 $\angle C \cong \angle Y$
2 $\angle A \cong \angle X$
3 $\overline{AC} \cong \overline{YZ}$
4 $\overline{CB} \cong \overline{XZ}$

801 The diagram below shows a pair of congruent triangles, with $\angle ADB \cong \angle CDB$ and $\angle ABD \cong \angle CBD$.



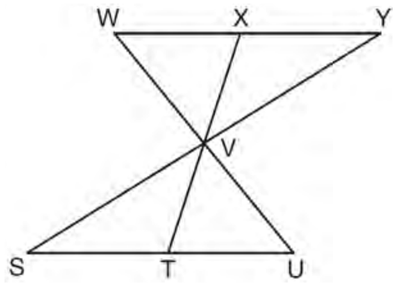
Which statement must be true?

1 $\angle ADB \cong \angle CBD$
2 $\angle ABC \cong \angle ADC$
3 $\overline{AB} \cong \overline{CD}$
4 $\overline{AD} \cong \overline{CD}$

802 If $\triangle MNP \cong \triangle VWX$ and $\overline{PM}$ is the shortest side of $\triangle MNP$, what is the shortest side of $\triangle VWX$?

1 $\overline{XV}$
2 $\overline{WX}$
3 $\overline{VW}$
4 $\overline{NP}$

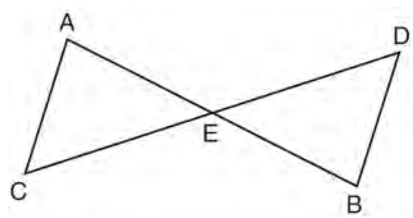
803 In the diagram below, $\triangle XYV \cong \triangle TSV$.



Which statement can *not* be proven?
1 $\angle XVY \cong \angle TVS$
2 $\angle VYX \cong \angle VUT$
3 $\overline{XY} \cong \overline{TS}$
4 $\overline{YV} \cong \overline{SV}$

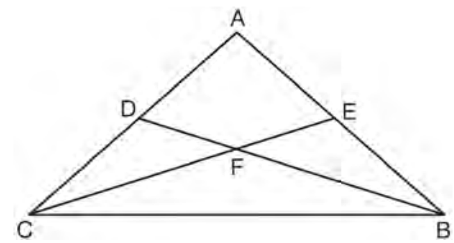
804 If $\triangle ABC \cong \triangle JKL \cong \triangle RST$, then $\overline{BC}$ must be congruent to
1 $\overline{JL}$
2 $\overline{JK}$
3 $\overline{ST}$
4 $\overline{RS}$

805 In the diagram below, $\triangle AEC \cong \triangle BED$.



Which statement is *not* always true?
1 $\overline{AC} \cong \overline{BD}$
2 $\overline{CE} \cong \overline{DE}$
3 $\angle EAC \cong \angle EBD$
4 $\angle ACE \cong \angle DBE$

806 In $\triangle ABC$ shown below with $\overline{ADC}$, $\overline{AEB}$, $\overline{CFE}$, and $\overline{BFD}$, $\triangle ACE \cong \triangle ABD$.



Which statement must be true?
1 $\angle ACF \cong \angle BCF$
2 $\angle DAE \cong \angle DFE$
3 $\angle BCD \cong \angle ABD$
4 $\angle AEF \cong \angle ADF$

G.G.27: LINE PROOFS

807 In the diagram below of $\overline{ABCD}$, $\overline{AC} \cong \overline{BD}$.

Using this information, it could be proven that
1 $BC = AB$
2 $AB = CD$
3 $AD - BC = CD$
4 $AB + CD = AD$

808 In the diagram of $\overline{WXYZ}$ below, $\overline{WY} \cong \overline{XZ}$.

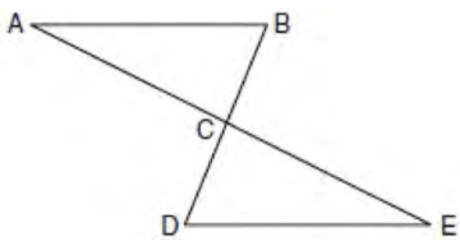
Which reasons can be used to prove $\overline{WX} \cong \overline{YZ}$?
1 reflexive property and addition postulate
2 reflexive property and subtraction postulate
3 transitive property and addition postulate
4 transitive property and subtraction postulate

G.G.27: ANGLE PROOFS

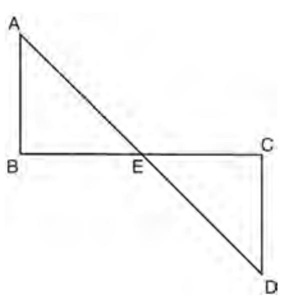
809 When writing a geometric proof, which angle relationship could be used alone to justify that two angles are congruent?
1 supplementary angles
2 linear pair of angles
3 adjacent angles
4 vertical angles

G.G.27: TRIANGLE PROOFS

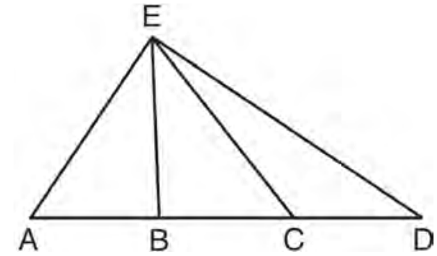
810 Given: $\triangle ABC$ and $\triangle EDC$, C is the midpoint of $\overline{BD}$ and $\overline{AE}$
Prove: $\overline{AB} \parallel \overline{DE}$



811 Given: $\overline{AD}$ bisects $\overline{BC}$ at E.
$\overline{AB} \perp \overline{BC}$
$\overline{DC} \perp \overline{BC}$
Prove: $\overline{AB} \cong \overline{DC}$

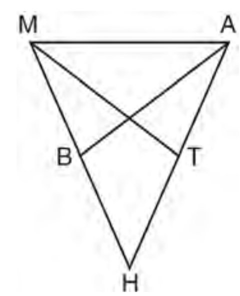


812 In $\triangle AED$ with $\overline{ABCD}$ shown in the diagram below, $\overline{EB}$ and $\overline{EC}$ are drawn.

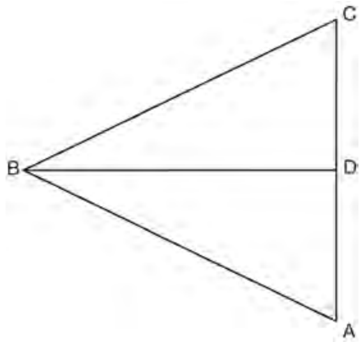


If $\overline{AB} \cong \overline{CD}$, which statement could always be proven?
1 $\overline{AC} \cong \overline{DB}$
2 $\overline{AE} \cong \overline{ED}$
3 $\overline{AB} \cong \overline{BC}$
4 $\overline{EC} \cong \overline{EA}$

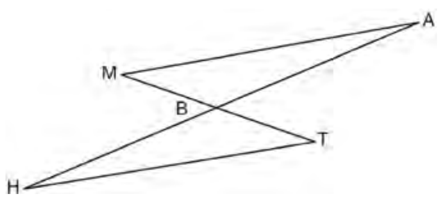
813 In the diagram of $\triangle MAH$ below, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are drawn.
Prove: $\angle MBA \cong \angle ATM$



814 Given: $\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$
Prove: $\overline{AB} \cong \overline{CB}$

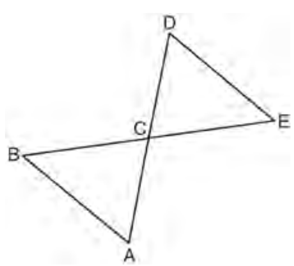


815 Given: $\overline{MT}$ and $\overline{HA}$ intersect at B, $\overline{MA} \parallel \overline{HT}$, and $\overline{MT}$ bisects $\overline{HA}$.



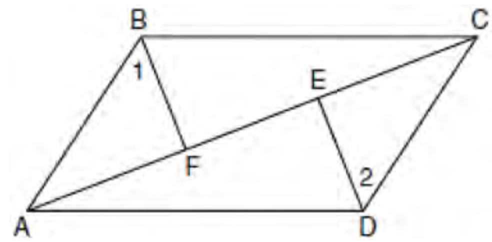
Prove: $\overline{MA} \cong \overline{HT}$

816 Given: $\overline{BE}$ and $\overline{AD}$ intersect at point C
$\overline{BC} \cong \overline{EC}$
$\overline{AC} \cong \overline{DC}$
$\overline{AB}$ and $\overline{DE}$ are drawn
Prove: $\triangle ABC \cong \triangle DEC$

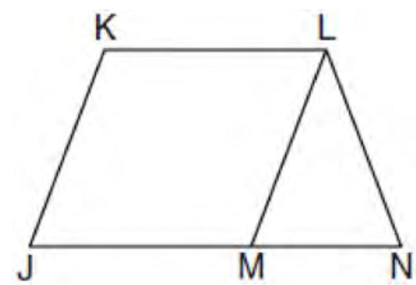


G.G.27: QUADRILATERAL PROOFS

817 Given: Quadrilateral $ABCD$, diagonal $\overline{AFEC}$, $\overline{AE} \cong \overline{FC}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$, $\angle 1 \cong \angle 2$
Prove: $ABCD$ is a parallelogram.

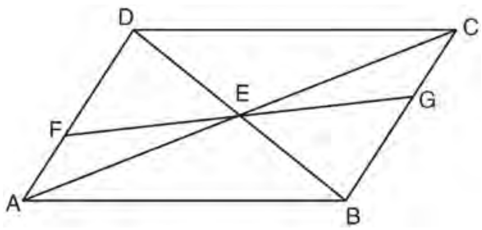


818 Given: $JKLM$ is a parallelogram.
$\overline{JM} \cong \overline{LN}$
$\angle LMN \cong \angle LNM$
Prove: $JKLM$ is a rhombus.

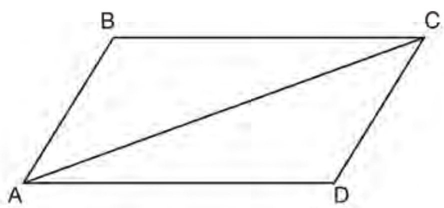


819 Given: Quadrilateral $ABCD$ with $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{BC}$, and diagonal $\overline{BD}$ is drawn
Prove: $\angle BDC \cong \angle ABD$

820 In the diagram below of quadrilateral $ABCD$, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$. Line segments AC, DB, and FG intersect at E. Prove: $\triangle AEF \cong \triangle CEG$



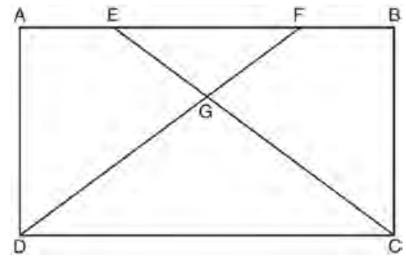
821 Given that $ABCD$ is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.



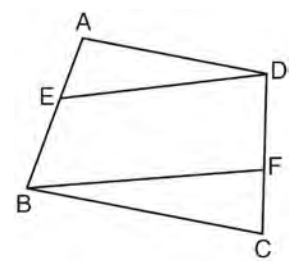
Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$ $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side
5. $\angle B \cong \angle D$	5. ______________

What is the reason justifying that $\angle B \cong \angle D$?
1 Opposite angles in a quadrilateral are congruent.
2 Parallel lines have congruent corresponding angles.
3 Corresponding parts of congruent triangles are congruent.
4 Alternate interior angles in congruent triangles are congruent.

822 The diagram below shows rectangle $ABCD$ with points E and F on side $\overline{AB}$. Segments CE and DF intersect at G, and $\angle ADG \cong \angle BCG$. Prove: $\overline{AE} \cong \overline{BF}$

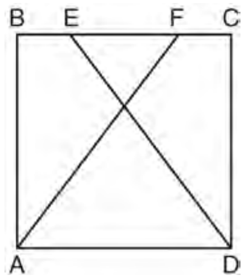


823 In the diagram below of quadrilateral $ABCD$, E and F are points on $\overline{AB}$ and $\overline{CD}$, respectively, $\overline{BE} \cong \overline{DF}$, and $\overline{AE} \cong \overline{CF}$.

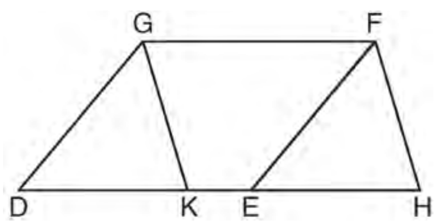


Which conclusion can be proven?
1 $\overline{ED} \cong \overline{FB}$
2 $\overline{AB} \cong \overline{CD}$
3 $\angle A \cong \angle C$
4 $\angle AED \cong \angle CFB$

824 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn. Prove that $\overline{AF} \cong \overline{DE}$.



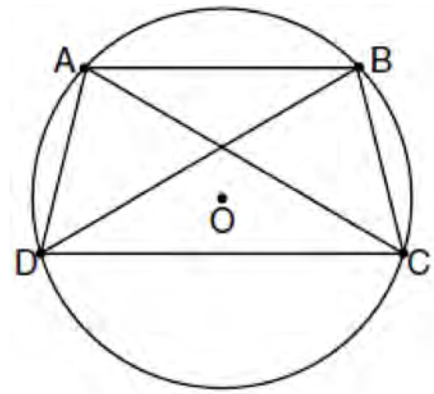
825 Given: Parallelogram $DEFG$, K and H are points on $\overrightarrow{DE}$ such that $\angle DGK \cong \angle EFH$ and $\overline{GK}$ and $\overline{FH}$ are drawn.



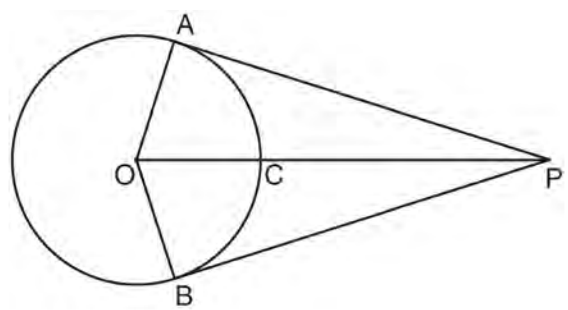
Prove: $\overline{DK} \cong \overline{EH}$

G.G.27: CIRCLE PROOFS

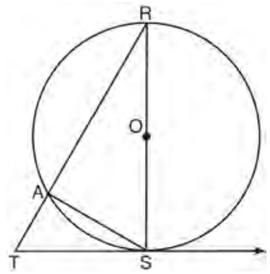
826 In the diagram below, quadrilateral $ABCD$ is inscribed in circle O, $\overline{AB} \parallel \overline{DC}$, and diagonals $\overline{AC}$ and $\overline{BD}$ are drawn. Prove that $\triangle ACD \cong \triangle BDC$.



827 In the diagram below, $\overline{PA}$ and $\overline{PB}$ are tangent to circle O, $\overline{OA}$ and $\overline{OB}$ are radii, and $\overline{OP}$ intersects the circle at C. Prove: $\angle AOP \cong \angle BOP$



828 In the diagram of circle O below, diameter $\overline{RS}$, chord $\overline{AS}$, tangent $\overrightarrow{TS}$, and secant $\overline{TAR}$ are drawn.

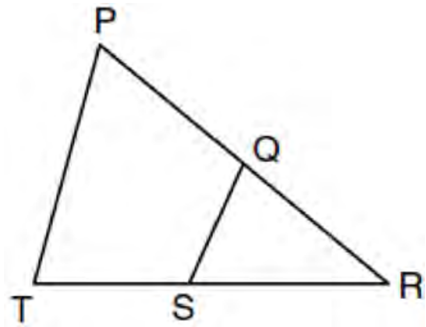


Complete the following proof to show $(RS)^2 = RA \cdot RT$

Statements	Reasons
1. circle O, diameter $\overline{RS}$, chord $\overline{AS}$, tangent $\overleftrightarrow{TS}$, and secant $\overline{TAR}$	1. Given
2. $\overline{RS} \perp \overleftrightarrow{TS}$	2. ________
3. $\angle RST$ is a right angle	3. $\perp$ lines form right angles
4. $\angle RAS$ is a right angle	4. ________
5. $\angle RST \cong \angle RAS$	5. ________
6. $\angle R \cong \angle R$	6. Reflexive property
7. $\triangle RST \sim \triangle RAS$	7. ________
8. $\frac{RS}{RA} = \frac{RT}{RS}$	8. ________
9. $(RS)^2 = RA \bullet RT$	9. ________

G.G.44: SIMILARITY PROOFS

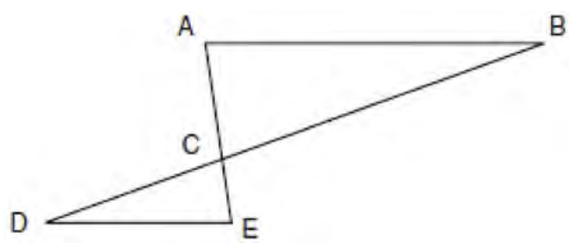
829 In the diagram below of $\triangle PRT$, Q is a point on $\overline{PR}$, S is a point on $\overline{TR}$, $\overline{QS}$ is drawn, and $\angle RPT \cong \angle RSQ$.



Which reason justifies the conclusion that $\triangle PRT \sim \triangle SRQ$?

1 AA
2 ASA
3 SAS
4 SSS

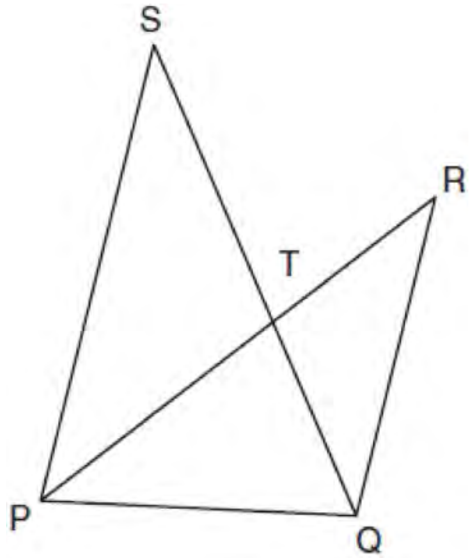
830 In the diagram of $\triangle ABC$ and $\triangle EDC$ below, $\overline{AE}$ and $\overline{BD}$ intersect at C, and $\angle CAB \cong \angle CED$.



Which method can be used to show that $\triangle ABC$ must be similar to $\triangle EDC$?

1 SAS
2 AA
3 SSS
4 HL

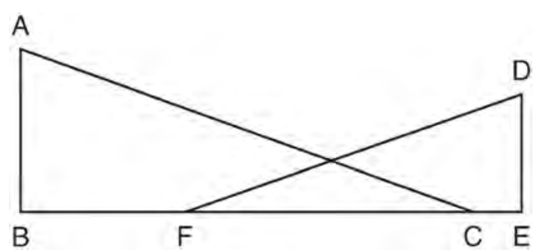
831 In the diagram below, $\overline{SQ}$ and $\overline{PR}$ intersect at T, $\overline{PQ}$ is drawn, and $\overline{PS} \parallel \overline{QR}$.



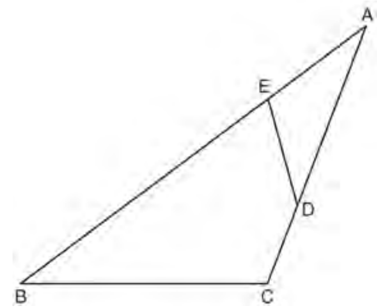
What technique can be used to prove that $\triangle PST \sim \triangle RQT$?

1 SAS
2 SSS
3 ASA
4 AA

832 In the diagram below, $\overline{BFCE}$, $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$, and $\angle BFD \cong \angle ECA$. Prove that $\triangle ABC \sim \triangle DEF$.



833 The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. Prove that $\triangle ABC$ is similar to $\triangle ADE$.



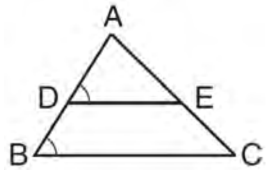
834 In $\triangle ABC$ and $\triangle DEF$, $\frac{AC}{DF} = \frac{CB}{FE}$. Which additional information would prove $\triangle ABC \sim \triangle DEF$?

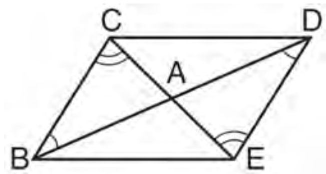
1 $AC = DF$
2 $CB = FE$
3 $\angle ACB \cong \angle DFE$
4 $\angle BAC \cong \angle EDF$

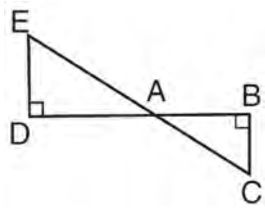
835 In triangles ABC and DEF, $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?

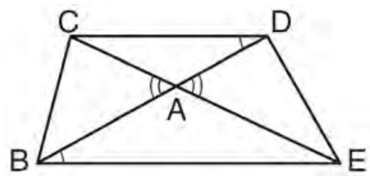
1 AA
2 SAS
3 SSS
4 ASA

836 For which diagram is the statement $\triangle ABC \sim \triangle ADE$ *not* always true??

1 

2 

3 

4 

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

1 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$ so the slope of this line is $-\frac{5}{3}$ Perpendicular lines have slope that are the opposite and reciprocal of each other.

PTS: 2 REF: fall0828ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

2 ANS: 4

The slope of $y = -\frac{2}{3}x - 5$ is $-\frac{2}{3}$. Perpendicular lines have slope that are opposite reciprocals.

PTS: 2 REF: 080917ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

3 ANS: 3

$m = \frac{-A}{B} = -\frac{3}{4}$

PTS: 2 REF: 011025ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

4 ANS: 2 PTS: 2 REF: 061022ge STA: G.G.62
TOP: Parallel and Perpendicular Lines

5 ANS: 3

$2y = -6x + 8$ Perpendicular lines have slope the opposite and reciprocal of each other.

$y = -3x + 4$

$m = -3$

$m_{\perp} = \frac{1}{3}$

PTS: 2 REF: 081024ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

6 ANS:

$m = \frac{-A}{B} = \frac{6}{2} = 3$. $m_{\perp} = -\frac{1}{3}$.

PTS: 2 REF: 011134ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

7 ANS: 4

The slope of $3x + 5y = 4$ is $m = \frac{-A}{B} = \frac{-3}{5}$. $m_{\perp} = \frac{5}{3}$.

PTS: 2 REF: 061127ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

8 ANS: 2

The slope of $x + 2y = 3$ is $m = \frac{-A}{B} = \frac{-1}{2}$. $m_{\perp} = 2$.

PTS: 2 REF: 081122ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

9 ANS: 2

$m = \frac{-A}{B} = \frac{-20}{-2} = 10.$ $m_{\perp} = -\frac{1}{10}$

PTS: 2 REF: 061219ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

10 ANS: 3

The slope of $9x - 3y = 27$ is $m = \frac{-A}{B} = \frac{-9}{-3} = 3$, which is the opposite reciprocal of $-\frac{1}{3}$.

PTS: 2 REF: 081225ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

11 ANS: 2

The slope of $2x + 4y = 12$ is $m = \frac{-A}{B} = \frac{-2}{4} = -\frac{1}{2}$. $m_{\perp} = 2$.

PTS: 2 REF: 011310ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

12 ANS: 2

$m = \frac{-A}{B} = \frac{-2}{3}$ $m_{\perp} = \frac{3}{2}$

PTS: 2 REF: 061417ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

13 ANS: 2

$m = \frac{-A}{B} = \frac{-3}{-7} = \frac{3}{7}$ $m_{\perp} = -\frac{7}{3}$

PTS: 2 REF: 081414ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

14 ANS: 3

$m = \frac{-A}{B} = \frac{-2}{3}$ $m_{\perp} = \frac{3}{2}$

PTS: 2 REF: 011610ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

15 ANS:

$$\frac{x-1}{4} = \frac{-3}{8}$$

$$8x - 8 = -12$$

$$8x = -4$$

$$x = -\frac{1}{2}$$

PTS: 2 REF: 011534ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

16 ANS: 4

$3y+1=6x+4$. $2y+1=x-9$

$$\begin{aligned} 3y &= 6x+3 \qquad & 2y &= x-10 \\ y &= 2x+1 & y &= \frac{1}{2}x-5 \end{aligned}$$

PTS: 2 REF: fall0822ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

17 ANS: 2

The slope of $2x+3y=12$ is $-\frac{A}{B}=-\frac{2}{3}$. The slope of a perpendicular line is $\frac{3}{2}$. Rewritten in slope intercept form, (2) becomes $y=\frac{3}{2}x+3$.

PTS: 2 REF: 060926ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

18 ANS: 3

The slope of $y=x+2$ is 1. The slope of $y-x=-1$ is $\frac{-A}{B}=\frac{-(-1)}{1}=1$.

PTS: 2 REF: 080909ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

19 ANS: 3

$m=\frac{-A}{B}=\frac{5}{2}$. $m=\frac{-A}{B}=\frac{10}{4}=\frac{5}{2}$

PTS: 2 REF: 011014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

20 ANS: 1

$$-2\left(-\frac{1}{2}y=6x+10\right)$$

$$y=-12x-20$$

PTS: 2 REF: 061027ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

21 ANS: 2

$$\begin{aligned} y+\frac{1}{2}x &= 4 \qquad & 3x+6y &= 12 \\ & & 6y &= -3x+12 \\ y &= -\frac{1}{2}x+4 & y &= -\frac{3}{6}x+2 \\ m &= -\frac{1}{2} & y &= -\frac{1}{2}x+2 \end{aligned}$$

PTS: 2 REF: 081014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

22 ANS: 4

$x + 6y = 12$ $\qquad$ $3(x - 2) = -y - 4$

$6y = -x + 12$ $\qquad$ $-3(x - 2) = y + 4$

$y = -\frac{1}{6}x + 2$ $\qquad$ $m = -3$

$m = -\frac{1}{6}$

PTS: 2 REF: 011119ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

23 ANS: 1 PTS: 2 REF: 061113ge STA: G.G.63
TOP: Parallel and Perpendicular Lines

24 ANS: 4 PTS: 2 REF: 011613ge STA: G.G.63
TOP: Parallel and Perpendicular Lines

25 ANS:

The slope of $y = 2x + 3$ is 2. The slope of $2y + x = 6$ is $\frac{-A}{B} = \frac{-1}{2}$. Since the slopes are opposite reciprocals, the lines are perpendicular.

PTS: 2 REF: 011231ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

26 ANS:

The slope of $x + 2y = 4$ is $m = \frac{-A}{B} = \frac{-1}{2}$. The slope of $4y - 2x = 12$ is $\frac{-A}{B} = \frac{2}{4} = \frac{1}{2}$. Since the slopes are neither equal nor opposite reciprocals, the lines are neither parallel nor perpendicular.

PTS: 2 REF: 061231ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

27 ANS: 3

$m = \frac{-A}{B} = \frac{-3}{-2} = \frac{3}{2}$

PTS: 2 REF: 011324ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

28 ANS: 4

$m_{\overleftrightarrow{AB}} = \frac{6-3}{7-5} = \frac{3}{2}$. $m_{\overleftrightarrow{CD}} = \frac{4-0}{6-9} = \frac{4}{-3}$

PTS: 2 REF: 061318ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

29 ANS: 4

$3y + 6 = 2x$ $\qquad$ $2y - 3x = 6$

$3y = 2x - 6$ $\qquad$ $2y = 3x + 6$

$y = \frac{2}{3}x - 2$ $\qquad$ $y = \frac{3}{2}x + 3$

$m = \frac{2}{3}$ $\qquad$ $m = \frac{3}{2}$

PTS: 2 REF: 081315ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

30 ANS:

Neither. The slope of $y = \frac{1}{2}x - 1$ is $\frac{1}{2}$. The slope of $y + 4 = -\frac{1}{2}(x - 2)$ is $-\frac{1}{2}$. The slopes are neither the same nor opposite reciprocals.

PTS: 2 REF: 011433ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

31 ANS: 1

$k: \frac{-A}{B} = \frac{-1}{2}$ $p: \frac{-A}{B} = \frac{-6}{3} = -2$ $m: \frac{-A}{B} = \frac{-(-1)}{2} = \frac{1}{2}$

PTS: 2 REF: 081426ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

32 ANS: 4

$m = \frac{-A}{B} = \frac{-4}{6} = -\frac{2}{3}$

PTS: 2 REF: 011520ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

33 ANS: 4

$k: m = \frac{2}{3}$ $m: m = \frac{-A}{B} = \frac{-2}{3}$ $n: m = \frac{3}{2}$

PTS: 2 REF: 061518ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

34 ANS: 2

The slope of $y = \frac{1}{2}x + 5$ is $\frac{1}{2}$. The slope of a perpendicular line is -2.

$$\begin{aligned} y &= mx + b \\ 5 &= (-2)(-2) + b \\ b &= 1 \end{aligned}$$

.

PTS: 2 REF: 060907ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

35 ANS: 4

The slope of $y = -3x + 2$ is -3. The perpendicular slope is $\frac{1}{3}$.

$$\begin{aligned} -1 &= \frac{1}{3}(3) + b \\ -1 &= 1 + b \\ b &= -2 \end{aligned}$$

PTS: 2 REF: 011018ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

36 ANS:

$y=\frac{2}{3}x+1$. $2y+3x=6$. $y=mx+b$

$2y=-3x+6$ $\quad 5=\frac{2}{3}(6)+b$

$y=-\frac{3}{2}x+3$ $\quad 5=4+b$

$m=-\frac{3}{2}$ $\quad 1=b$

$m_\perp=\frac{2}{3}$ $\quad y=\frac{2}{3}x+1$

PTS: 4 REF: 061036ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

37 ANS: 3 PTS: 2 REF: 011217ge STA: G.G.64
TOP: Parallel and Perpendicular Lines

38 ANS: 4

$m_\perp=-\frac{1}{3}$. $y=mx+b$

$6=-\frac{1}{3}(-9)+b$

$6=3+b$

$3=b$

PTS: 2 REF: 061215ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

39 ANS: 3

The slope of $2y=x+2$ is $\frac{1}{2}$, which is the opposite reciprocal of -2. $3=-2(4)+b$

$11=b$

PTS: 2 REF: 081228ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

40 ANS: 4

$m=\frac{2}{3}$. $2=-\frac{3}{2}(4)+b$

$m_\perp=-\frac{3}{2}$ $\quad 2=-6+b$

$8=b$

PTS: 2 REF: 011319ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

41 ANS: 2

$m=\frac{1}{3}$ $\quad 12=-3(-9)+b$

$m_\perp=-3$ $\quad 12=27+b$

$-15=b$

PTS: 2 REF: 081404ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

42 ANS: 1

$m = \frac{6}{3} = 2$ $m_{\perp} = -\frac{1}{2}$ $4 = -\frac{1}{2}(2) + b$

$4 = -1 + b$

$5 = b$

PTS: 2 REF: 061507ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

43 ANS:

$m = \frac{3}{2}$; $m_{\perp} = -\frac{2}{3}$ $y = -\frac{2}{3}x$

PTS: 2 REF: 081533ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

44 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-2}{-1} = 2$. A parallel line would also have a slope of 2. Since the answers are in slope intercept form, find the y-intercept: $y = mx + b$

$-11 = 2(-3) + b$

$-5 = b$

PTS: 2 REF: fall0812ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

45 ANS: 3

$m = \frac{-A}{B} = \frac{-3}{-4} = \frac{3}{4}$ $6 = \frac{3}{4}(-2) + b$ $y = \frac{3}{4}x + \frac{15}{2}$

$\frac{12}{2} = \frac{-3}{2} + b$ $4y = 3x + 30$

$\frac{15}{2} = b$ $-3x + 4y = 30$

PTS: 2 REF: 011620ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

46 ANS:

$y = -2x + 14$. The slope of $2x + y = 3$ is $\frac{-A}{B} = \frac{-2}{1} = -2$. $y = mx + b$.

$4 = (-2)(5) + b$

$b = 14$

PTS: 2 REF: 060931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

47 ANS:

$y = \frac{2}{3}x - 9$. The slope of $2x - 3y = 11$ is $-\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}$. $-5 = \left(\frac{2}{3}\right)(6) + b$

$-5 = 4 + b$

$b = -9$

PTS: 2 REF: 080931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

48 ANS: 4

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-4}{2}=-2$. A parallel line would also have a slope of −2. Since the answers are in slope intercept form, find the y-intercept:

$$\begin{aligned} y &= mx+b \\ 3 &= -2(7)+b \\ 17 &= b \end{aligned}$$

PTS: 2 REF: 081010ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

49 ANS: 4

$$\begin{aligned} y &= mx+b \\ 3 &= \frac{3}{2}(-2)+b \\ 3 &= -3+b \\ 6 &= b \end{aligned}$$

PTS: 2 REF: 011114ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

50 ANS: 2

The slope of a line in standard form is $\frac{-A}{B}$, so the slope of this line is $\frac{-4}{3}$. A parallel line would also have a slope of $\frac{-4}{3}$. Since the answers are in standard form, use the point-slope formula.

$$\begin{aligned} y-2 &= -\frac{4}{3}(x+5) \\ 3y-6 &= -4x-20 \\ 4x+3y &= -14 \end{aligned}$$

PTS: 2 REF: 061123ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

51 ANS: 2

$m=\frac{-A}{B}=\frac{-4}{2}=-2$

$$\begin{aligned} y &= mx+b \\ 2 &= -2(2)+b \\ 6 &= b \end{aligned}$$

PTS: 2 REF: 081112ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

52 ANS: 3

$$\begin{aligned} y &= mx+b \\ -1 &= 2(2)+b \\ -5 &= b \end{aligned}$$

PTS: 2 REF: 011224ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

53 ANS: 4

$m = \frac{-A}{B} = \frac{-3}{2}$. $\quad y = mx + b$

$$-1 = \left(\frac{-3}{2}\right)(2) + b$$

$$-1 = -3 + b$$

$$2 = b$$

PTS: 2 REF: 061226ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

54 ANS: 1

$m = \frac{3}{2} \quad y = mx + b$

$$2 = \frac{3}{2}(1) + b$$

$$\frac{1}{2} = b$$

PTS: 2 REF: 081217ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

55 ANS: 3

$2y = 3x - 4. \quad 1 = \frac{3}{2}(6) + b$

$y = \frac{3}{2}x - 2 \quad 1 = 9 + b$

$$-8 = b$$

PTS: 2 REF: 061316ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

56 ANS: 2

$m = \frac{-A}{B} = \frac{-5}{1} = -5 \quad y = mx + b$

$$3 = -5(5) + b$$

$$28 = b$$

PTS: 2 REF: 011410ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

57 ANS: 1

$m = \frac{-A}{B} = \frac{1}{2} \quad -1 = \frac{1}{2}(4) + b$

$$-1 = 2 + b$$

$$-3 = b$$

PTS: 2 REF: 061420ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

58 ANS: 2 PTS: 2 REF: 081421ge STA: G.G.65
TOP: Parallel and Perpendicular Lines

59 ANS:

$m = \frac{1}{3}$ $4 = \frac{1}{3}(-3) + b$ $y = \frac{1}{3}x + 5$

$4 = -1 + b$

$5 = b$

PTS: 2 REF: 011532ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

60 ANS: 4

$\frac{2}{3}(x - 4) = y - 5$

$2x - 8 = 3y - 15$

$7 = 3y - 2x$

PTS: 2 REF: 061528ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

61 ANS: 3

$m = \frac{-A}{B} = \frac{-4}{-2} = 2$ $y = mx + b$

$1 = 2(-2) + b$

$1 = -4 + b$

$5 = b$

PTS: 2 REF: 081509ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

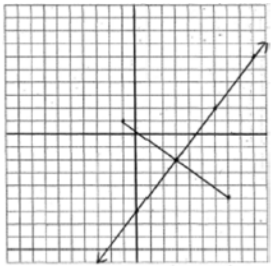
62 ANS:

$y = \frac{4}{3}x - 6.$ $M_x = \frac{-1+7}{2} = 3$ The perpendicular bisector goes through $(3,-2)$ and has a slope of $\frac{4}{3}$.

$M_y = \frac{1+(-5)}{2} = -2$

$m = \frac{1-(-5)}{-1-7} = -\frac{3}{4}$

$y - y_M = m(x - x_M).$



$y - 1 = \frac{4}{3}(x - 2)$

PTS: 4 REF: 080935ge STA: G.G.68 TOP: Perpendicular Bisector

63 ANS: 1

$m=\left(\frac{8+0}{2},\frac{2+6}{2}\right)=(4,4)$ $m=\frac{6-2}{0-8}=\frac{4}{-8}=-\frac{1}{2}$ $m_{\perp}=2$ $y=mx+b$

$4=2(4)+b$

$-4=b$

PTS: 2 REF: 081126ge STA: G.G.68 TOP: Perpendicular Bisector

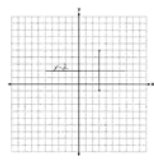
64 ANS: 4

$\overline{AB}$ is a vertical line, so its perpendicular bisector is a horizontal line through the midpoint of $\overline{AB}$, which is $(0,3)$.

PTS: 2 REF: 011225ge STA: G.G.68 TOP: Perpendicular Bisector

65 ANS:

$M=\left(\frac{3+3}{2},\frac{-1+5}{2}\right)=(3,2)$. $y=2$.



PTS: 2 REF: 011334ge STA: G.G.68 TOP: Perpendicular Bisector

66 ANS: 3

midpoint: $\left(\frac{6+8}{2},\frac{8+4}{2}\right)=(7,6)$. slope: $\frac{8-4}{6-8}=\frac{4}{-2}=-2$; $m_{\perp}=\frac{1}{2}$. $6=\frac{1}{2}(7)+b$

$\frac{12}{2}=\frac{7}{2}+b$

$\frac{5}{12}=b$

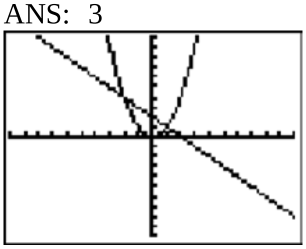
PTS: 2 REF: 081327ge STA: G.G.68 TOP: Perpendicular Bisector

67 ANS:

$M=\left(\frac{4+8}{2},\frac{2+6}{2}\right)=(6,4)$ $m=\frac{6-2}{8-4}=\frac{4}{4}=1$ $m_{\perp}=-1$ $y-1=-(x-6)$

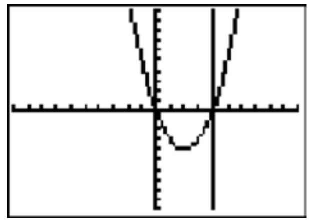
PTS: 4 REF: 081536ge STA: G.G.68 TOP: Perpendicular Bisector

68 ANS: 3



PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

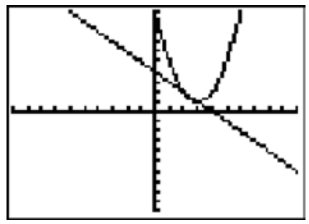
69 ANS: 1



$y = x^2 - 4x = (4)^2 - 4(4) = 0$. (4,0) is the only intersection.

PTS: 2 REF: 060923ge STA: G.G.70 TOP: Quadratic-Linear Systems

70 ANS: 4



$y + x = 4$. $x^2 - 6x + 10 = -x + 4$. $y + x = 4$. $y + 2 = 4$

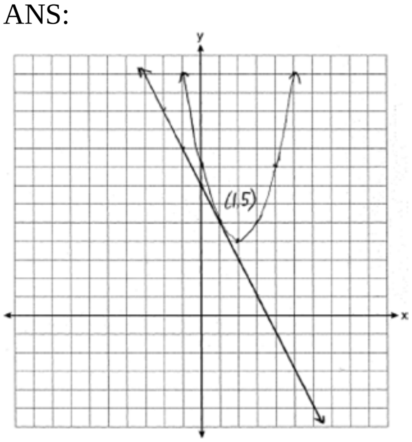
$y = -x + 4$ $\quad x^2 - 5x + 6 = 0$ $\quad y + 3 = 4$ $\quad y = 2$

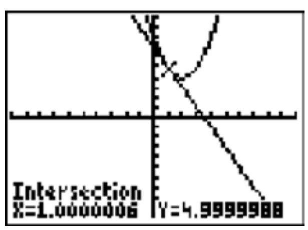
$(x - 3)(x - 2) = 0$ $\quad y = 1$

$x = 3$ or 2

PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

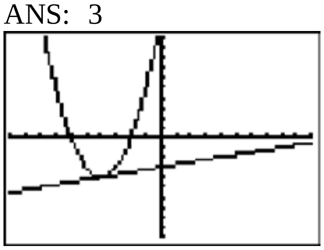
71 ANS:





PTS: 6 REF: 011038ge STA: G.G.70 TOP: Quadratic-Linear Systems

72 ANS: 3



PTS: 2 REF: 061011ge STA: G.G.70 TOP: Quadratic-Linear Systems

73 ANS: 3

$$(x+3)^2 - 4 = 2x + 5$$

$$x^2 + 6x + 9 - 4 = 2x + 5$$

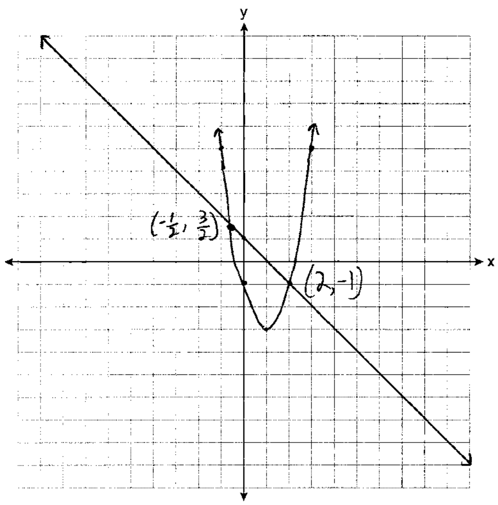
$$x^2 + 4x = 0$$

$$x(x+4) = 0$$

$$x = 0, -4$$

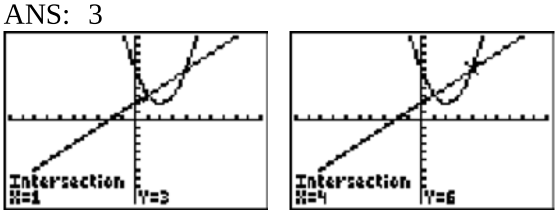
PTS: 2 REF: 081004ge STA: G.G.70 TOP: Quadratic-Linear Systems

74 ANS:



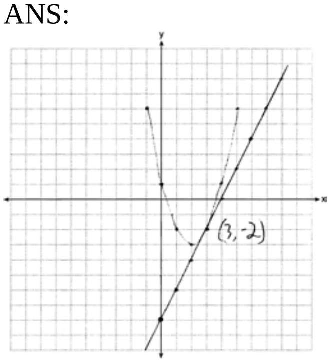
PTS: 4 REF: 061137ge STA: G.G.70 TOP: Quadratic-Linear Systems

75 ANS: 3



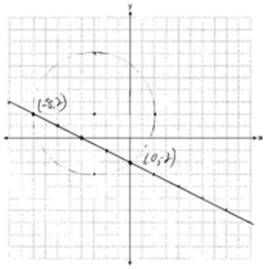
PTS: 2 REF: 081118ge STA: G.G.70 TOP: Quadratic-Linear Systems

76 ANS:



PTS: 6 REF: 061238ge STA: G.G.70 TOP: Quadratic-Linear Systems

77 ANS:



PTS: 4 REF: 081237ge STA: G.G.70 TOP: Quadratic-Linear Systems

78 ANS: 3

$x^2 + 5^2 = 25$

$x = 0$

PTS: 2 REF: 011312ge STA: G.G.70 TOP: Quadratic-Linear Systems

79 ANS: 2 PTS: 2 REF: 061313ge STA: G.G.70
TOP: Quadratic-Linear Systems

80 ANS: 2

$(x-4)^2 - 2 = -2x + 6.$ $y = -2(4) + 6 = -2$

$x^2 - 8x + 16 - 2 = -2x + 6$ $y = -2(2) + 6 = 2$

$x^2 - 6x + 8 = 0$

$(x-4)(x-2) = 0$

$x = 4, 2$

PTS: 2 REF: 081319ge STA: G.G.70 TOP: Quadratic-Linear Systems

81 ANS: 2

$x^2 - 2 = x$

$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$

$x = 2, -1$

PTS: 2 REF: 011409ge STA: G.G.70 TOP: Quadratic-Linear Systems

82 ANS: 2

$x + 2x = x^2$ $(0,0), (3,3)$

$0 = x^2 - 3x$

$0 = x(x-3)$

$x = 0, 3$

PTS: 2 REF: 061406ge STA: G.G.70 TOP: Quadratic-Linear Systems

83 ANS: 1

$x^2 + 5 = x + 5 \quad y = (0) + 5 = 5$

$x^2 - x = 0 \quad y = (1) + 5 = 6$

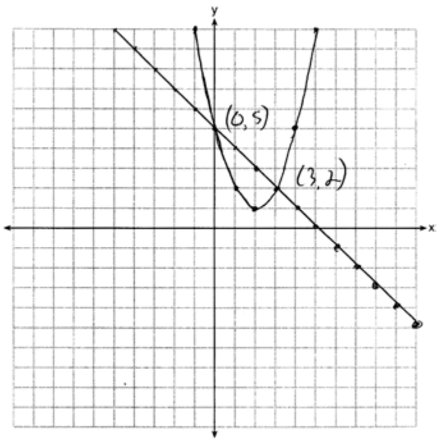
$x(x-1) = 0$

$x = 0, 1$

PTS: 2 REF: 081406ge STA: G.G.70 TOP: Quadratic-Linear Systems

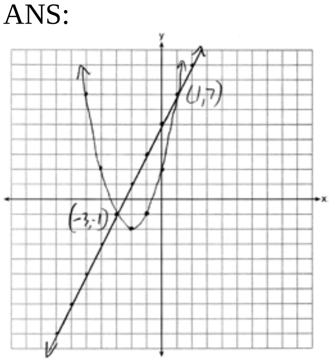
84 ANS: 4 PTS: 2 REF: 011501ge STA: G.G.70
TOP: Quadratic-Linear Systems

85 ANS:



PTS: 4 REF: 061535ge STA: G.G.70 TOP: Quadratic-Linear Systems

86 ANS:



PTS: 4 REF: 011636ge STA: G.G.70 TOP: Quadratic-Linear Systems

87 ANS: 4

$2x + 3 = -x^2 - x + 1 \quad y = 2(-2) + 3 = -1$

$x^2 + 3x + 2 = 0$

$(x+2)(x+1) = 0$

$x = -2, -1$

PTS: 2 REF: 081516ge STA: G.G.70 TOP: Quadratic-Linear Systems

88 ANS: 2

$M_x = \frac{2+(-4)}{2} = -1.\ \ M_Y = \frac{-3+6}{2} = \frac{3}{2}.$

PTS: 2 REF: fall0813ge STA: G.G.66 TOP: Midpoint
KEY: general

89 ANS: 4

$M_x = \frac{-6+1}{2} = -\frac{5}{2}.\ \ M_y = \frac{1+8}{2} = \frac{9}{2}.$

PTS: 2 REF: 060919ge STA: G.G.66 TOP: Midpoint
KEY: graph

90 ANS: 2

$M_x = \frac{-2+6}{2} = 2.\ \ M_y = \frac{-4+2}{2} = -1$

PTS: 2 REF: 080910ge STA: G.G.66 TOP: Midpoint
KEY: general

91 ANS:

$(6,-4).\ \ C_x = \frac{Q_x + R_x}{2}.\ \ C_y = \frac{Q_y + R_y}{2}.$

$$3.5 = \frac{1+R_x}{2} \qquad 2 = \frac{8+R_y}{2}$$

$$7 = 1 + R_x \qquad 4 = 8 + R_y$$

$$6 = R_x \qquad -4 = R_y$$

PTS: 2 REF: 011031ge STA: G.G.66 TOP: Midpoint
KEY: graph

92 ANS: 2

$M_x = \frac{3x+5+x-1}{2} = \frac{4x+4}{2} = 2x+2.\ \ M_Y = \frac{3y+(-y)}{2} = \frac{2y}{2} = y.$

PTS: 2 REF: 081019ge STA: G.G.66 TOP: Midpoint
KEY: general

93 ANS: 2

$M_x = \frac{7+(-3)}{2} = 2.\ \ M_Y = \frac{-1+3}{2} = 1.$

PTS: 2 REF: 011106ge STA: G.G.66 TOP: Midpoint

94 ANS:

$(2a-3, 3b+2).\ \ \left(\frac{3a+a-6}{2}, \frac{2b-1+4b+5}{2}\right) = \left(\frac{4a-6}{2}, \frac{6b+4}{2}\right) = (2a-3, 3b+2)$

PTS: 2 REF: 061134ge STA: G.G.66 TOP: Midpoint

95 ANS: 1

$$1 = \frac{-4+x}{2}. \qquad 5 = \frac{3+y}{2}.$$

$$-4+x=2 \qquad 3+y=10$$

$$x=6 \qquad y=7$$

PTS: 2 REF: 081115ge STA: G.G.66 TOP: Midpoint

96 ANS: 4

$$-5 = \frac{-3+x}{2}. \quad 2 = \frac{6+y}{2}$$

$$-10=-3+x \qquad 4=6+y$$

$$-7=x \qquad -2=y$$

PTS: 2 REF: 081203ge STA: G.G.66 TOP: Midpoint

97 ANS: 3

$$6 = \frac{4+x}{2}. \qquad 8 = \frac{2+y}{2}.$$

$$4+x=12 \qquad 2+y=16$$

$$x=8 \qquad y=14$$

PTS: 2 REF: 011305ge STA: G.G.66 TOP: Midpoint

98 ANS: 2

$$M_x = \frac{8+(-3)}{2} = 2.5. \;\; M_Y = \frac{-4+2}{2} = -1.$$

PTS: 2 REF: 061312ge STA: G.G.66 TOP: Midpoint

99 ANS: 2

$$\frac{6+x}{2} = 4. \;\; \frac{-4+y}{2} = 2$$

$$x=2 \qquad y=8$$

PTS: 2 REF: 011401ge STA: G.G.66 TOP: Midpoint

100 ANS: 1

$$M_x = \frac{-5+3}{2} = \frac{-2}{2} = -1. \;\; M_y = \frac{1+5}{2} = \frac{6}{2} = 3.$$

PTS: 2 REF: 061402ge STA: G.G.66 TOP: Midpoint

101 ANS: 3

$$M_x = \frac{1+10}{2} = \frac{11}{2} = 5.5 \;\; M_y = \frac{3+7}{2} = \frac{10}{2} = 5.$$

PTS: 2 REF: 081407ge STA: G.G.66 TOP: Midpoint
KEY: graph

102 ANS: 4

$M_x = \frac{2+8}{2} = 5.\ \ M_Y = \frac{-5+3}{2} = -1.$

PTS: 2 REF: 011502ge STA: G.G.66 TOP: Midpoint
KEY: general

103 ANS: 2

$2 = \frac{10+x}{2}.\quad 8 = \frac{12+y}{2}$

$4 = 10 + x \quad 16 = 12 + y$

$-6 = x \qquad 4 = y$

PTS: 2 REF: 061505ge STA: G.G.66 TOP: Midpoint

104 ANS:

25. $d = \sqrt{(-3-4)^2 + (1-25)^2} = \sqrt{49+576} = \sqrt{625} = 25.$

PTS: 2 REF: fall0831ge STA: G.G.67 TOP: Distance
KEY: general

105 ANS: 1

$d = \sqrt{(-4-2)^2 + (5-(-5))^2} = \sqrt{36+100} = \sqrt{136} = \sqrt{4} \cdot \sqrt{34} = 2\sqrt{34}.$

PTS: 2 REF: 080919ge STA: G.G.67 TOP: Distance
KEY: general

106 ANS: 4

$d = \sqrt{(-3-1)^2 + (2-0)^2} = \sqrt{16+4} = \sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$

PTS: 2 REF: 011017ge STA: G.G.67 TOP: Distance
KEY: general

107 ANS: 4

$d = \sqrt{(146-(-4))^2 + (52-2)^2} = \sqrt{25{,}000} \approx 158.1$

PTS: 2 REF: 061021ge STA: G.G.67 TOP: Distance
KEY: general

108 ANS: 4

$d = \sqrt{(-6-2)^2 + (4-(-5))^2} = \sqrt{64+81} = \sqrt{145}$

PTS: 2 REF: 081013ge STA: G.G.67 TOP: Distance
KEY: general

109 ANS: 4

$d = \sqrt{(-5-3)^2 + (4-(-6))^2} = \sqrt{64+100} = \sqrt{164} = \sqrt{4}\sqrt{41} = 2\sqrt{41}$

PTS: 2 REF: 011121ge STA: G.G.67 TOP: Distance
KEY: general

110 ANS: 2

$d=\sqrt{(-1-7)^2+(9-4)^2}=\sqrt{64+25}=\sqrt{89}$

PTS: 2 REF: 061109ge STA: G.G.67 TOP: Distance
KEY: general

111 ANS: 3

$d=\sqrt{(1-9)^2+(-4-2)^2}=\sqrt{64+36}=\sqrt{100}=10$

PTS: 2 REF: 081107ge STA: G.G.67 TOP: Distance
KEY: general

112 ANS: 1

$d=\sqrt{(4-1)^2+(7-11)^2}=\sqrt{9+16}=\sqrt{25}=5$

PTS: 2 REF: 011205ge STA: G.G.67 TOP: Distance
KEY: general

113 ANS: 3

$d=\sqrt{(-1-4)^2+(0-(-3))^2}=\sqrt{25+9}=\sqrt{34}$

PTS: 2 REF: 061217ge STA: G.G.67 TOP: Distance
KEY: general

114 ANS:

$\sqrt{(6--9)^2+(4--4)^2}=\sqrt{225+64}=\sqrt{289}=17$

PTS: 2 REF: 011632ge STA: G.G.67 TOP: Distance

115 ANS:

$\sqrt{(-4-2)^2+(3-5)^2}=\sqrt{36+4}=\sqrt{40}=\sqrt{4}\sqrt{10}=2\sqrt{10}.$

PTS: 2 REF: 081232ge STA: G.G.67 TOP: Distance

116 ANS:

$\sqrt{(-1-3)^2+(4-(-2))^2}=\sqrt{16+36}=\sqrt{52}=\sqrt{4}\sqrt{13}=2\sqrt{13}$

PTS: 2 REF: 081331ge STA: G.G.67 TOP: Distance

117 ANS:

$\sqrt{(3-7)^2+(-4-2)^2}=\sqrt{16+36}=\sqrt{52}=\sqrt{4}\sqrt{13}=2\sqrt{13}.$

PTS: 2 REF: 011431ge STA: G.G.67 TOP: Distance

118 ANS: 3

$d=\sqrt{(-2-4)^2+(3-5)^2}=\sqrt{36+4}=\sqrt{40}=2\sqrt{10}$

PTS: 2 REF: 061411ge STA: G.G.67 TOP: Distance
KEY: general

119 ANS: 2 PTS: 2 REF: 081415ge STA: G.G.67
TOP: Distance KEY: general

120 ANS: 1

$d = \sqrt{(5-1)^2 + (3-6)^2} = \sqrt{16+9} = \sqrt{25} = 5$

PTS: 2 REF: 011507ge STA: G.G.67 TOP: Distance
KEY: general

121 ANS:

$\sqrt{(6-3)^2 + (-1-8)^2} = \sqrt{9+81} = \sqrt{90} = \sqrt{9}\sqrt{10} = 3\sqrt{10}$.

PTS: 2 REF: 061533ge STA: G.G.67 TOP: Distance

122 ANS: 3 PTS: 2 REF: fall0816ge STA: G.G.1
TOP: Planes

123 ANS: 4 PTS: 2 REF: 011012ge STA: G.G.1
TOP: Planes

124 ANS: 3 PTS: 2 REF: 061017ge STA: G.G.1
TOP: Planes

125 ANS: 4 PTS: 2 REF: 061118ge STA: G.G.1
TOP: Planes

126 ANS: 3 PTS: 2 REF: 081218ge STA: G.G.1
TOP: Planes

127 ANS: 4 PTS: 2 REF: 011315ge STA: G.G.1
TOP: Planes

128 ANS: 3 PTS: 2 REF: 061522ge STA: G.G.1
TOP: Planes

129 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes

130 ANS: 1 PTS: 2 REF: 011128ge STA: G.G.2
TOP: Planes

131 ANS: 1 PTS: 2 REF: 061310ge STA: G.G.2
TOP: Planes

132 ANS: 1 PTS: 2 REF: 081514ge STA: G.G.2
TOP: Planes

133 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes

134 ANS: 1 PTS: 2 REF: 081008ge STA: G.G.3
TOP: Planes

135 ANS: 1 PTS: 2 REF: 011218ge STA: G.G.3
TOP: Planes

136 ANS: 1 PTS: 2 REF: 061418ge STA: G.G.3
TOP: Planes

137 ANS: 1 PTS: 2 REF: 011512ge STA: G.G.3
TOP: Planes

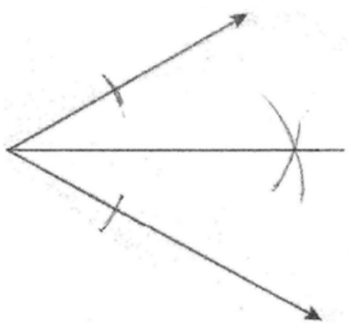
138 ANS: 1 PTS: 2 REF: 061514ge STA: G.G.3
TOP: Planes

139 ANS: 2 PTS: 2 REF: 080927ge STA: G.G.4
TOP: Planes
140 ANS: 4 PTS: 2 REF: 061213ge STA: G.G.5
TOP: Planes
141 ANS: 3
As originally administered, this question read, "Which fact is *not* sufficient to show that planes $\mathcal{R}$ and $\mathcal{S}$ are perpendicular?" The State Education Department stated that since a correct solution was not provided for Question 11, all students shall be awarded credit for this question.

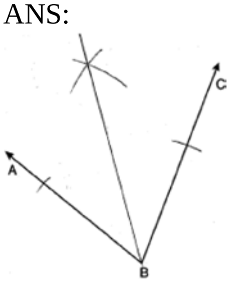
PTS: 2 REF: 081211ge STA: G.G.5 TOP: Planes
142 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes
143 ANS: 1 PTS: 2 REF: 081116ge STA: G.G.7
TOP: Planes
144 ANS: 3 PTS: 2 REF: 060928ge STA: G.G.8
TOP: Planes
145 ANS: 2 PTS: 2 REF: 081120ge STA: G.G.8
TOP: Planes
146 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes
147 ANS: 3 PTS: 2 REF: 081002ge STA: G.G.9
TOP: Planes
148 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes
149 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes
150 ANS: 4 PTS: 2 REF: 061203ge STA: G.G.9
TOP: Planes
151 ANS: 4 PTS: 2 REF: 011306ge STA: G.G.9
TOP: Planes
152 ANS: 1 PTS: 2 REF: 081323ge STA: G.G.9
TOP: Planes
153 ANS: 1 PTS: 2 REF: 011404ge STA: G.G.9
TOP: Planes
154 ANS: 3 PTS: 2 REF: 061401ge STA: G.G.9
TOP: Planes
155 ANS: 3
The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids
156 ANS: 4 PTS: 2 REF: 061003ge STA: G.G.10
TOP: Solids
157 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids
158 ANS: 1 PTS: 2 REF: 011221ge STA: G.G.10
TOP: Solids

159 ANS: 4 PTS: 2 REF: 011621ge STA: G.G.10
TOP: Solids
160 ANS: 2 PTS: 2 REF: 081311ge STA: G.G.10
TOP: Solids
161 ANS: 4 PTS: 2 REF: 011406ge STA: G.G.10
TOP: Solids
162 ANS: 4 PTS: 2 REF: 081401ge STA: G.G.10
TOP: Solids
163 ANS: 1 PTS: 2 REF: 011526ge STA: G.G.10
TOP: Solids
164 ANS: 4 PTS: 2 REF: 061503ge STA: G.G.10
TOP: Solids
165 ANS: 1 PTS: 2 REF: 081508ge STA: G.G.10
TOP: Solids
166 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids
167 ANS: 2 PTS: 2 REF: 061315ge STA: G.G.13
TOP: Solids
168 ANS:

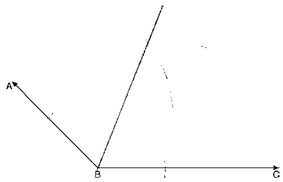


PTS: 2 REF: fall0832ge STA: G.G.17 TOP: Constructions
169 ANS: 3 PTS: 2 REF: 060925ge STA: G.G.17
TOP: Constructions
170 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17
TOP: Constructions
171 ANS:



PTS: 2 REF: 080932ge STA: G.G.17 TOP: Constructions
172 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17
TOP: Constructions

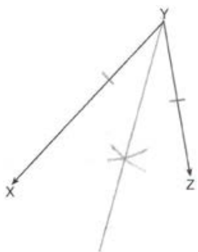
173 ANS:



PTS: 2 REF: 011133ge STA: G.G.17 TOP: Constructions

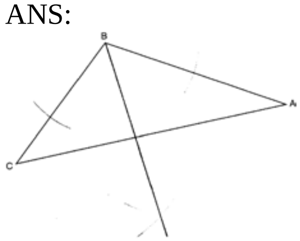
174 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions

175 ANS:



PTS: 2 REF: 011233ge STA: G.G.17 TOP: Constructions

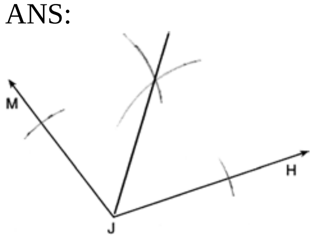
176 ANS:



PTS: 2 REF: 061232ge STA: G.G.17 TOP: Constructions

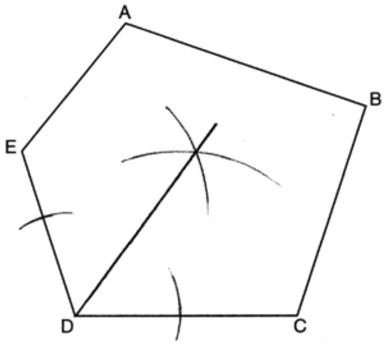
177 ANS: 2 PTS: 2 REF: 081205ge STA: G.G.17
TOP: Constructions

178 ANS:



PTS: 2 REF: 081330ge STA: G.G.17 TOP: Constructions

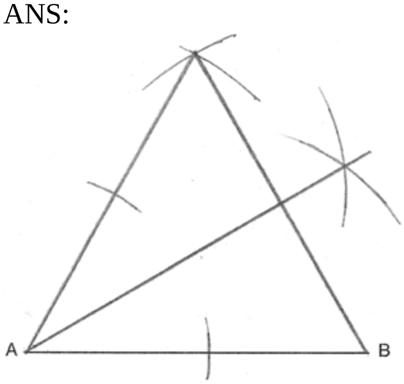
179 ANS:



PTS: 2 REF: 011634ge STA: G.G.17 TOP: Constructions

180 ANS: 3 PTS: 2 REF: 011402ge STA: G.G.17
TOP: Constructions

181 ANS:



PTS: 4 REF: 061437ge STA: G.G.17 TOP: Constructions

182 ANS: 2 PTS: 2 REF: 011509ge STA: G.G.17
TOP: Constructions

183 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions

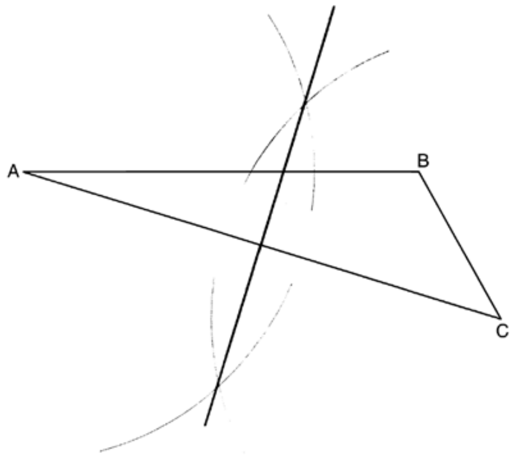
184 ANS: 4 PTS: 2 REF: 081005ge STA: G.G.18
TOP: Constructions

185 ANS: 1 PTS: 2 REF: 011120ge STA: G.G.18
TOP: Constructions

186 ANS: 2 PTS: 2 REF: 061101ge STA: G.G.18
TOP: Constructions

187 ANS: 2 PTS: 2 REF: 011628ge STA: G.G.18
TOP: Constructions

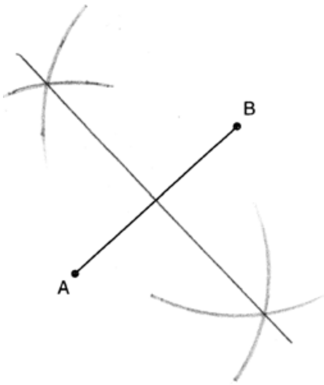
188 ANS:



PTS: 2 REF: 081130ge STA: G.G.18 TOP: Constructions

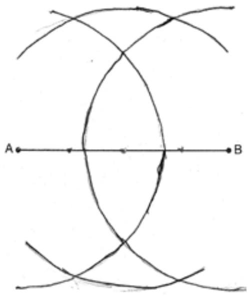
189 ANS: 2 PTS: 2 REF: 061305ge STA: G.G.18
TOP: Constructions

190 ANS:



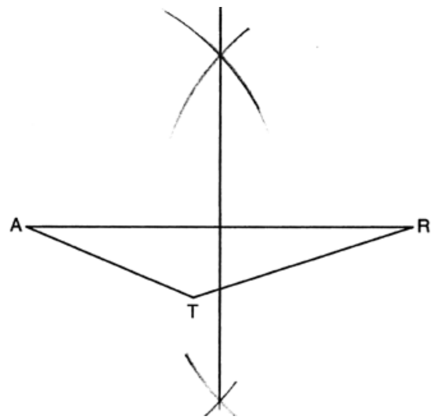
PTS: 2 REF: 011430ge STA: G.G.18 TOP: Constructions

191 ANS:



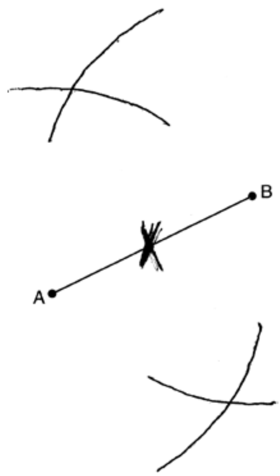
PTS: 4 REF: 081437ge STA: G.G.18 TOP: Constructions

192 ANS:



PTS: 2 REF: 011530ge STA: G.G.18 TOP: Constructions

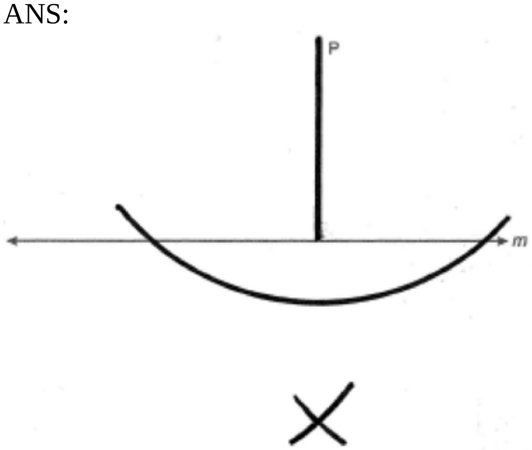
193 ANS:



PTS: 2 REF: 061532ge STA: G.G.18 TOP: Constructions

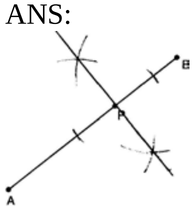
194 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions

195 ANS:

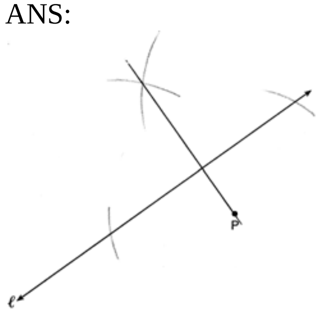


PTS: 2 REF: 060930ge STA: G.G.19 TOP: Constructions

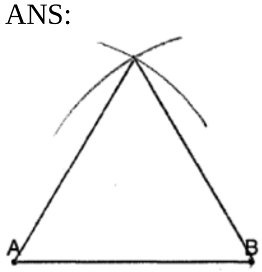
196 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19
TOP: Constructions
197 ANS: 2 PTS: 2 REF: 061020ge STA: G.G.19
TOP: Constructions
198 ANS: 2 PTS: 2 REF: 061208ge STA: G.G.19
TOP: Constructions
199 ANS:



PTS: 2 REF: 081233ge STA: G.G.19 TOP: Constructions
200 ANS:

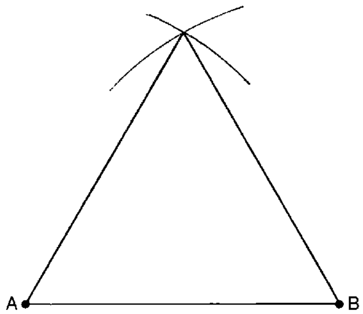


PTS: 2 REF: 011333ge STA: G.G.19 TOP: Constructions
201 ANS: 4 PTS: 2 REF: 081313ge STA: G.G.19
TOP: Constructions
202 ANS: 2 PTS: 2 REF: 061512ge STA: G.G.19
TOP: Constructions
203 ANS: 3 PTS: 2 REF: 081512ge STA: G.G.19
TOP: Constructions
204 ANS:



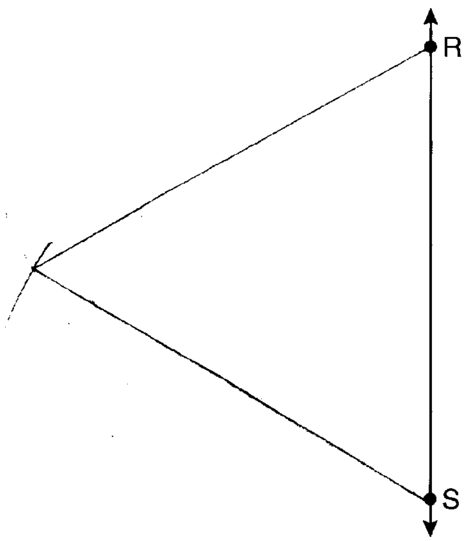
PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions
205 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions

206 ANS:



PTS: 2 REF: 081032ge STA: G.G.20 TOP: Constructions

207 ANS:

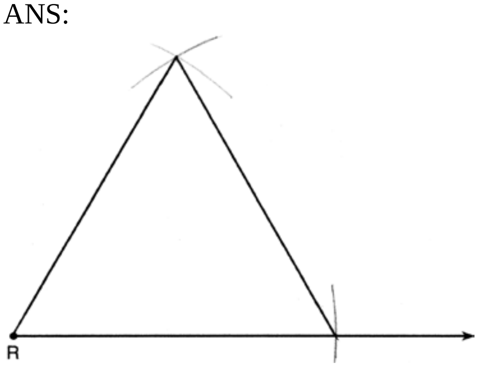


PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

208 ANS: 1 PTS: 2 REF: 011207ge STA: G.G.20
TOP: Constructions

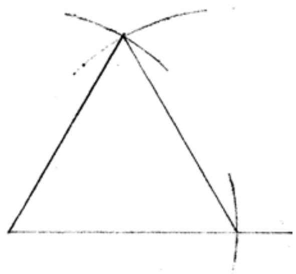
209 ANS: 3 PTS: 2 REF: 011309ge STA: G.G.20
TOP: Constructions

210 ANS:



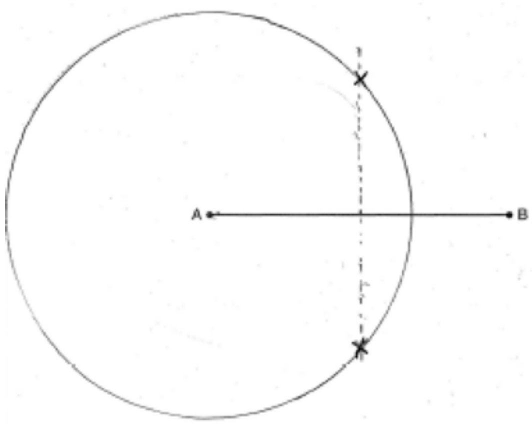
PTS: 2 REF: 061332ge STA: G.G.20 TOP: Constructions

211 ANS:



PTS: 2 REF: 081532ge STA: G.G.20 TOP: Constructions

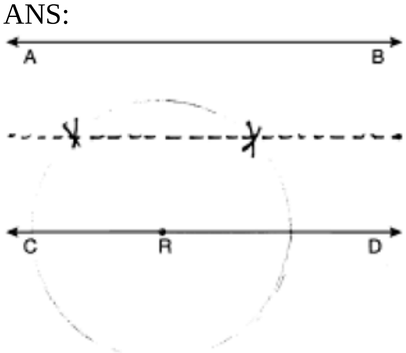
212 ANS:



PTS: 2 REF: 060932ge STA: G.G.22 TOP: Locus

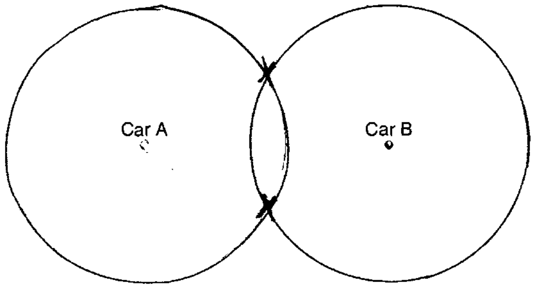
213 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

214 ANS:



PTS: 2 REF: 061033ge STA: G.G.22 TOP: Locus

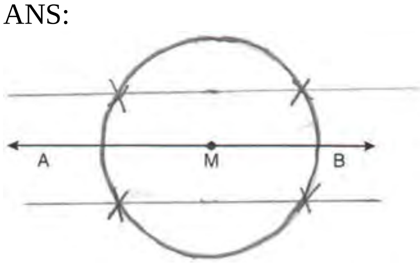
215 ANS:



PTS: 2 REF: 081033ge STA: G.G.22 TOP: Locus

216 ANS: 2 PTS: 2 REF: 061121ge STA: G.G.22
TOP: Locus

217 ANS:

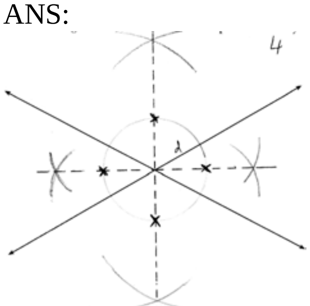


PTS: 2 REF: 011230ge STA: G.G.22 TOP: Locus

218 ANS: 2 PTS: 2 REF: 011317ge STA: G.G.22
TOP: Locus

219 ANS: 4 PTS: 2 REF: 061303ge STA: G.G.22
TOP: Locus

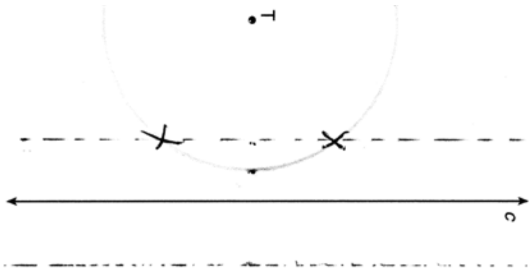
220 ANS:



PTS: 2 REF: 081334ge STA: G.G.22 TOP: Locus

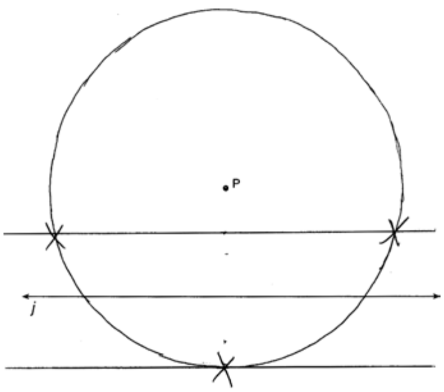
221 ANS: 2 PTS: 2 REF: 011609ge STA: G.G.22
TOP: Locus

222 ANS:



PTS: 2 REF: 011434ge STA: G.G.22 TOP: Locus

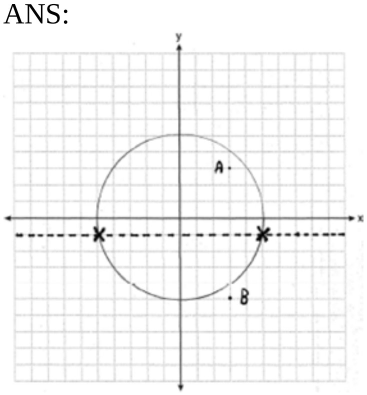
223 ANS:



PTS: 4 REF: 061537ge STA: G.G.22 TOP: Locus

224 ANS: 1 PTS: 2 REF: 081522ge STA: G.G.22
TOP: Locus

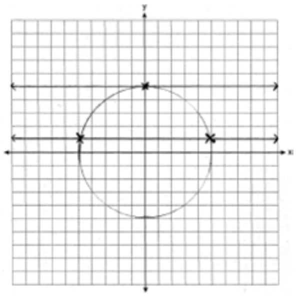
225 ANS:



PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

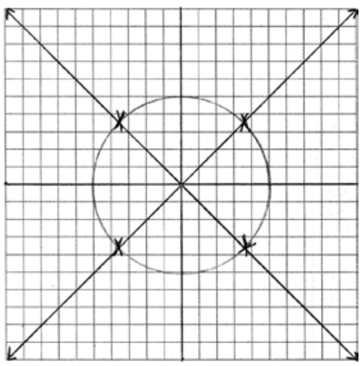
226 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

227 ANS:



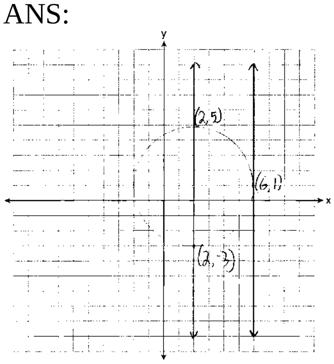
PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

228 ANS:



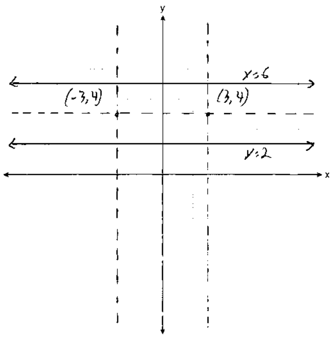
PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

229 ANS:



PTS: 4 REF: 011135ge STA: G.G.23 TOP: Locus

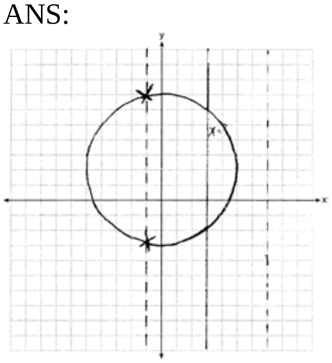
230 ANS:



PTS: 4 REF: 061135ge STA: G.G.23 TOP: Locus

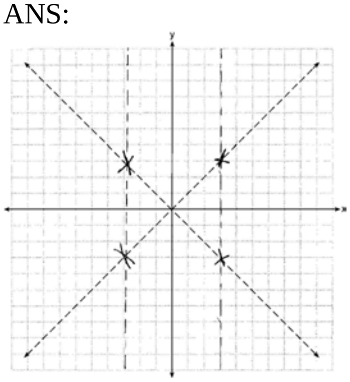
231 ANS: 2 PTS: 2 REF: 081117ge STA: G.G.23
TOP: Locus

232 ANS:



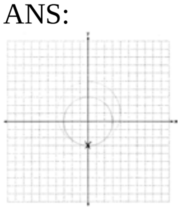
PTS: 2 REF: 061234ge STA: G.G.23 TOP: Locus

233 ANS:



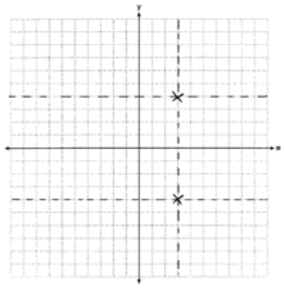
PTS: 2 REF: 081234ge STA: G.G.23 TOP: Locus

234 ANS:



PTS: 2 REF: 011331ge STA: G.G.23 TOP: Locus

235 ANS:

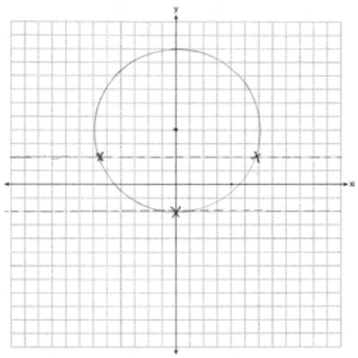


PTS: 2 REF: 061333ge STA: G.G.23 TOP: Locus

236 ANS: 2 PTS: 2 REF: 081316ge STA: G.G.23
TOP: Locus

237 ANS: 4 PTS: 2 REF: 011407ge STA: G.G.23
TOP: Locus

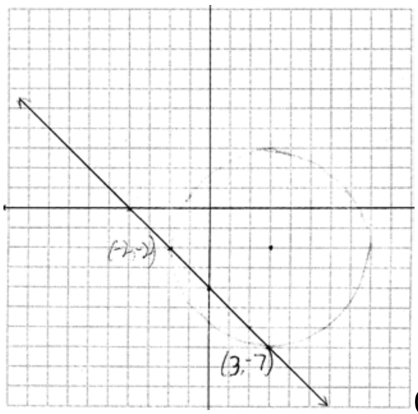
238 ANS:



PTS: 4 REF: 061436ge STA: G.G.23 TOP: Locus

239 ANS: 4 PTS: 2 REF: 011604ge STA: G.G.23
TOP: Locus

240 ANS:



$(x-3)^2+(y+2)^2=25$ $m=\dfrac{-6--4}{0-2}=\dfrac{-2}{-2}=1$ $M\left(\dfrac{0+2}{2},\dfrac{-6+-4}{2}\right)=M(1,-5)$

$m_{\perp}=-1$

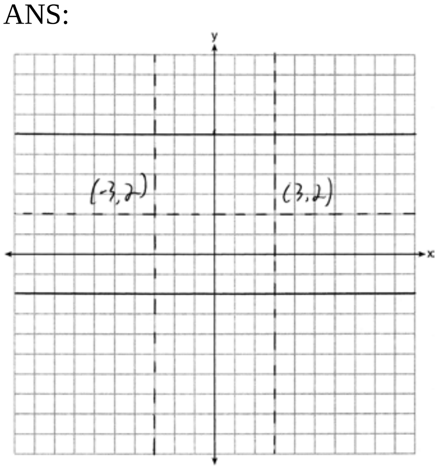
$-5=(-1)(1)+b$

$-4=b$

$y=-x-4$

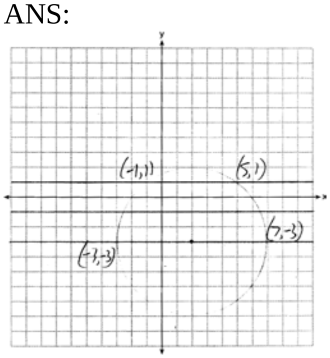
PTS: 6 REF: 081438ge STA: G.G.23 TOP: Locus

241 ANS:



PTS: 4 REF: 011536ge STA: G.G.23 TOP: Locus

242 ANS:



PTS: 4 REF: 081535ge STA: G.G.23 TOP: Locus

243 ANS: 4
The marked 60º angle and the angle above it are on the same straight line and supplementary. This unmarked supplementary angle is 120º. Because the unmarked 120º angle and the marked 120º angle are alternate exterior angles and congruent, $d \parallel e$.

PTS: 2 REF: 080901ge STA: G.G.35 TOP: Parallel Lines and Transversals

244 ANS: 2 PTS: 2 REF: 061007ge STA: G.G.35
TOP: Parallel Lines and Transversals

245 ANS:
Yes, $m\angle ABD = m\angle BDC = 44$ $180 - (93 + 43) = 44$ $x + 19 + 2x + 6 + 3x + 5 = 180$. Because alternate interior

$$6x + 30 = 180$$
$$6x = 150$$
$$x = 25$$
$$x + 19 = 44$$

angles $\angle ABD$ and $\angle CDB$ are congruent, $\overline{AB}$ is parallel to $\overline{DC}$.

PTS: 4 REF: 081035ge STA: G.G.35 TOP: Parallel Lines and Transversals

246 ANS: 2
$$7x = 5x + 30$$
$$2x = 30$$
$$x = 15$$

PTS: 2 REF: 061106ge STA: G.G.35 TOP: Parallel Lines and Transversals

247 ANS: 3
$$7x = 5x + 30$$
$$2x = 30$$
$$x = 15$$

PTS: 2 REF: 081109ge STA: G.G.35 TOP: Parallel Lines and Transversals

248 ANS: 2
$$6x + 42 = 18x - 12$$
$$54 = 12x$$
$$x = \frac{54}{12} = 4.5$$

PTS: 2 REF: 011201ge STA: G.G.35 TOP: Parallel Lines and Transversals

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

249 ANS: 3 PTS: 2 REF: 011612ge STA: G.G.35
TOP: Parallel Lines and Transversals

250 ANS:
$180-(90+63)=27$

PTS: 2 REF: 061230ge STA: G.G.35 TOP: Parallel Lines and Transversals

251 ANS: 3

$$\begin{aligned}4x+14+8x+10&=180\\12x&=156\\x&=13\end{aligned}$$

PTS: 2 REF: 081213ge STA: G.G.35 TOP: Parallel Lines and Transversals

252 ANS: 3 PTS: 2 REF: 061320ge STA: G.G.35
TOP: Parallel Lines and Transversals

253 ANS: 1

$$\begin{aligned}7x-36+5x+12&=180\\12x-24&=180\\12x&=204\\x&=17\end{aligned}$$

PTS: 2 REF: 011422ge STA: G.G.35 TOP: Parallel Lines and Transversals

254 ANS: 2

$$\begin{aligned}5x-22&=3x+10\\2x&=32\\x&=16\end{aligned}$$

PTS: 2 REF: 061403ge STA: G.G.35 TOP: Parallel Lines and Transversals

255 ANS: 4

$$\begin{aligned}2x+36+7x-9&=180\\9x+27&=180\\9x&=153\\x&=17\end{aligned}\quad m\angle 1=2(17)+36=70$$

PTS: 2 REF: 081427ge STA: G.G.35 TOP: Parallel Lines and Transversals

256 ANS: 4

$3x + 17 + 5x - 21 = 180$ $m\angle 1 = 3(23) + 17 = 86$

$8x - 4 = 180$

$8x = 184$

$x = 23$

PTS: 2 REF: 011513ge STA: G.G.35 TOP: Parallel Lines and Transversals

257 ANS: 1

$a^2 + (5\sqrt{2})^2 = (2\sqrt{15})^2$

$a^2 + (25 \times 2) = 4 \times 15$

$a^2 + 50 = 60$

$a^2 = 10$

$a = \sqrt{10}$

PTS: 2 REF: 011016ge STA: G.G.48 TOP: Pythagorean Theorem

258 ANS: 2

$x^2 + (x + 7)^2 = 13^2$

$x^2 + x^2 + 7x + 7x + 49 = 169$

$2x^2 + 14x - 120 = 0$

$x^2 + 7x - 60 = 0$

$(x + 12)(x - 5) = 0$

$x = 5$

$2x = 10$

PTS: 2 REF: 061024ge STA: G.G.48 TOP: Pythagorean Theorem

259 ANS: 3

$8^2 + 24^2 \neq 25^2$

PTS: 2 REF: 011111ge STA: G.G.48 TOP: Pythagorean Theorem

260 ANS: 3

$x^2 + 7^2 = (x + 1)^2$ $x + 1 = 25$

$x^2 + 49 = x^2 + 2x + 1$

$48 = 2x$

$24 = x$

PTS: 2 REF: 081127ge STA: G.G.48 TOP: Pythagorean Theorem

261 ANS: 2

$2^2 + 3^2 \neq 4^2$

PTS: 2 REF: 011316ge STA: G.G.48 TOP: Pythagorean Theorem

262 ANS: 4

$8^2 + 15^2 = 17^2$

PTS: 2 REF: 081418ge STA: G.G.48 TOP: Pythagorean Theorem

263 ANS: 1

If $\angle A$ is at minimum (50°) and $\angle B$ is at minimum (90°), $\angle C$ is at maximum of 40° (180° - (50° + 90°)). If $\angle A$ is at maximum (60°) and $\angle B$ is at maximum (100°), $\angle C$ is at minimum of 20° (180° - (60° + 100°)).

PTS: 2 REF: 060901ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

264 ANS: 1

In an equilateral triangle, each interior angle is 60° and each exterior angle is 120° (180° - 120°). The sum of the three interior angles is 180° and the sum of the three exterior angles is 360°.

PTS: 2 REF: 060909ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

265 ANS:

26. $x + 3x + 5x - 54 = 180$

$$9x = 234$$

$$x = 26$$

PTS: 2 REF: 080933ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

266 ANS: 1

$x + 2x + 2 + 3x + 4 = 180$

$$6x + 6 = 180$$

$$x = 29$$

PTS: 2 REF: 011002ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

267 ANS:

34. $2x - 12 + x + 90 = 180$

$$3x + 78 = 90$$

$$3x = 102$$

$$x = 34$$

PTS: 2 REF: 061031ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

268 ANS: 1

$3x + 5 + 4x - 15 + 2x + 10 = 180$. $m\angle D = 3(20) + 5 = 65$. $m\angle E = 4(20) - 15 = 65$.

$$9x = 180$$

$$x = 20$$

PTS: 2 REF: 061119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

269 ANS: 4

$$\frac{5}{2+3+5} \times 180 = 90$$

PTS: 2 REF: 081119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

270 ANS: 3

$$\frac{3}{8+3+4} \times 180 = 36$$

PTS: 2 REF: 011210ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

271 ANS: 4 PTS: 2 REF: 081206ge STA: G.G.30
TOP: Interior and Exterior Angles of Triangles

272 ANS: 1

$$\frac{180-52}{2} = 64.\ \ 180-(90+64) = 26$$

PTS: 2 REF: 011314ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

273 ANS: 3

$$\begin{aligned} 3x+1+4x-17+5x-20 &= 180. & 3(18)+1 &= 55 \\ 12x-36 &= 180 & 4(18)-17 &= 55 \\ 12x &= 216 & 5(18)-20 &= 70 \\ x &= 18 \end{aligned}$$

PTS: 2 REF: 061308ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

274 ANS:

$$\begin{aligned} A &= 2B-15 & .\ \ 2B-15+B+2B-15+B &= 180 \\ C &= A+B & 6B-30 &= 180 \\ C &= 2B-15+B & 6B &= 210 \\ & & B &= 35 \end{aligned}$$

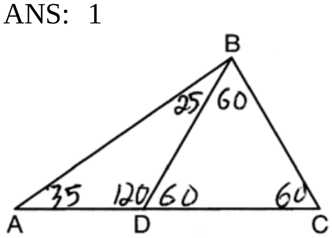
PTS: 2 REF: 081332ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

275 ANS: 3

$$\frac{4}{2+3+4} \times 180 = 80$$

PTS: 2 REF: 061404ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

276 ANS: 1

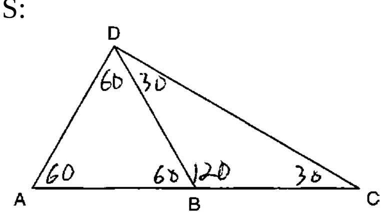


PTS: 2 REF: 011504ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

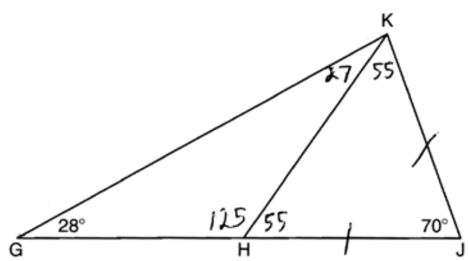
277 ANS:
$\frac{5}{5+6+7}\cdot 180 = 50$

PTS: 2 REF: 061529ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles
278 ANS: 4
$180-(40+40)=100$

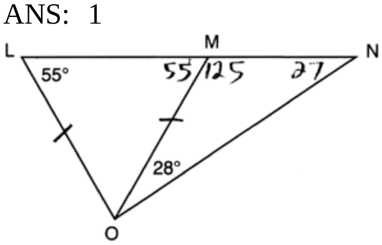
PTS: 2 REF: 080903ge STA: G.G.31 TOP: Isosceles Triangle Theorem
279 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31
TOP: Isosceles Triangle Theorem
280 ANS:
67. $\frac{180-46}{2}=67$

PTS: 2 REF: 011029ge STA: G.G.31 TOP: Isosceles Triangle Theorem
281 ANS: 3 PTS: 2 REF: 061004ge STA: G.G.31
TOP: Isosceles Triangle Theorem
282 ANS:


30.

PTS: 2 REF: 011129ge STA: G.G.31 TOP: Isosceles Triangle Theorem
283 ANS: 4 PTS: 2 REF: 061124ge STA: G.G.31
TOP: Isosceles Triangle Theorem
284 ANS:


No, $\angle KGH$ is not congruent to $\angle GKH$.

PTS: 2 REF: 081135ge STA: G.G.31 TOP: Isosceles Triangle Theorem
285 ANS: 1


PTS: 2 REF: 061211ge STA: G.G.31 TOP: Isosceles Triangle Theorem

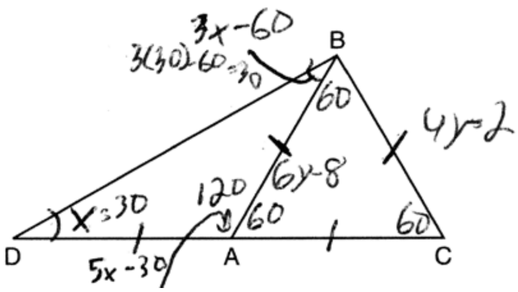
286 ANS: 2

$$3x + x + 20 + x + 20 = 180$$
$$5x = 40$$
$$x = 28$$

PTS: 2 REF: 081222ge STA: G.G.31 TOP: Isosceles Triangle Theorem

287 ANS:

$$x + 3x - 60 + 5x - 30 = 180 \quad 5(30) - 30 = 120 \quad 6y - 8 = 4y - 2 \quad \overline{DC} = 10 + 10 = 20$$
$$9x - 90 = 180 \quad m\angle BAC = 180 - 120 = 60 \quad 2y = 6$$
$$9x = 270 \quad y = 3$$
$$x = 30 = m\angle D \quad 4(3) - 2 = 10 = \overline{BC}$$



PTS: 3 REF: 011435ge STA: G.G.31 TOP: Isosceles Triangle Theorem

288 ANS: 2

$$x + x + x + 15 = 180$$
$$3x + 15 = 180$$
$$3x = 165$$
$$x = 15$$

PTS: 2 REF: 061407ge STA: G.G.31 TOP: Isosceles Triangle Theorem

289 ANS: 3

$$x + 40 = 2x + 20 \quad GH = 2(20) + 20 = 60$$
$$20 = x$$

PTS: 2 REF: 081416ge STA: G.G.31 TOP: Isosceles Triangle Theorem

290 ANS: 4

$$180 - \frac{180 - 80}{2} = 130$$

PTS: 2 REF: 011508ge STA: G.G.31 TOP: Isosceles Triangle Theorem

291 ANS: 2

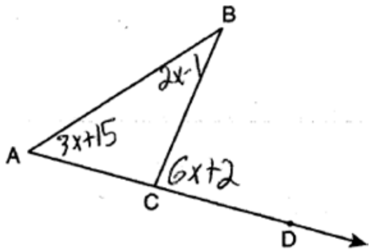
$$180 - 2(58) = 64$$

PTS: 2 REF: 081510ge STA: G.G.31 TOP: Isosceles Triangle Theorem

292 ANS: 4
(4) is not true if $\angle PQR$ is obtuse.

PTS: 2 REF: 060924ge STA: G.G.32 TOP: Exterior Angle Theorem

293 ANS: 1



$$3x+15+2x-1=6x+2$$
$$5x+14=6x+2$$
$$x=12$$

PTS: 2 REF: 011021ge STA: G.G.32 TOP: Exterior Angle Theorem

294 ANS:
110.
$$6x+20=x+40+4x-5$$
$$6x+20=5x+35$$
$$x=15$$
$$6((15)+20=110$$

PTS: 2 REF: 081031ge STA: G.G.32 TOP: Exterior Angle Theorem

295 ANS: 3
$$x+2x+15=5x+15 \quad 2(5)+15=25$$
$$3x+15=5x+5$$
$$10=2x$$
$$5=x$$

PTS: 2 REF: 011127ge STA: G.G.32 TOP: Exterior Angle Theorem

296 ANS: 2 PTS: 2 REF: 061107ge STA: G.G.32
TOP: Exterior Angle Theorem

297 ANS: 3 PTS: 2 REF: 081111ge STA: G.G.32
TOP: Exterior Angle Theorem

298 ANS: 2 PTS: 2 REF: 011206ge STA: G.G.32
TOP: Exterior Angle Theorem

299 ANS: 4

$$x^2 - 6x + 2x - 3 = 9x + 27$$
$$x^2 - 4x - 3 = 9x + 27$$
$$x^2 - 13x - 30 = 0$$
$$(x - 15)(x + 2) = 0$$
$$x = 15, -2$$

PTS: 2 REF: 061225ge STA: G.G.32 TOP: Exterior Angle Theorem

300 ANS: 3

$$2x + x + 30 = 5x - 50$$
$$80 = 2x$$
$$x = 40$$

PTS: 2 REF: 011615ge STA: G.G.32 TOP: Exterior Angle Theorem

301 ANS: 4

$6x = x + 40 + 3x + 10.$ $m\angle CAB = 25 + 40 = 65$

$$6x = 4x + 50$$
$$2x = 50$$
$$x = 25$$

PTS: 2 REF: 081310ge STA: G.G.32 TOP: Exterior Angle Theorem

302 ANS: 2

$m\angle ABC = 55$, so $m\angle ACR = 60 + 55 = 115$

PTS: 2 REF: 011414ge STA: G.G.32 TOP: Exterior Angle Theorem

303 ANS: 2

$x^2 + 5x = 4x + 110$ $m\angle Q = 4(10) = 40$

$$x^2 + x - 110 = 0$$
$$(x + 11)(x - 10) = 0$$
$$10 = x$$

PTS: 2 REF: 061425ge STA: G.G.32 TOP: Exterior Angle Theorem

304 ANS: 1

$$m\angle A + m\angle B = 50$$
$$30.1 + m\angle B = 50$$
$$m\angle B = 19.9$$

PTS: 2 REF: 081424ge STA: G.G.32 TOP: Exterior Angle Theorem

305 ANS: 3 PTS: 2 REF: 061508ge STA: G.G.32
TOP: Exterior Angle Theorem

306 ANS: 2
$7 + 18 > 6 + 12$

PTS: 2 REF: fall0819ge STA: G.G.33 TOP: Triangle Inequality Theorem
307 ANS: 2
$6 + 17 > 22$

PTS: 2 REF: 080916ge STA: G.G.33 TOP: Triangle Inequality Theorem
308 ANS: 4
$\frac{5}{20} - \frac{4}{20} = \frac{1}{20}$ $\frac{1}{20} < s < \frac{9}{20}$ $\frac{1}{2} > \frac{9}{20}$

$\frac{5}{20} + \frac{4}{20} = \frac{9}{20}$

PTS: 2 REF: 011625ge STA: G.G.33 TOP: Triangle Inequality Theorem
309 ANS: 2
$5 - 3 = 2, 5 + 3 = 8$

PTS: 2 REF: 011228ge STA: G.G.33 TOP: Triangle Inequality Theorem
310 ANS: 4
$3 + 6 > 8$

PTS: 2 REF: 061416ge STA: G.G.33 TOP: Triangle Inequality Theorem
311 ANS: 1
$10 - 4 < s < 10 + 4$

$6 < s < 14$

PTS: 2 REF: 011519ge STA: G.G.33 TOP: Triangle Inequality Theorem
312 ANS: 4
$11 - 7 = 4, 11 + 7 = 18$

PTS: 2 REF: 061525ge STA: G.G.33 TOP: Triangle Inequality Theorem
313 ANS: 2 PTS: 2 REF: 081527ge STA: G.G.33
TOP: Triangle Inequality Theorem
314 ANS: 2
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 060911ge STA: G.G.34 TOP: Angle Side Relationship
315 ANS:
$\overline{AC}$. $m\angle BCA = 63$ and $m\angle ABC = 80$. $\overline{AC}$ is the longest side as it is opposite the largest angle.

PTS: 2 REF: 080934ge STA: G.G.34 TOP: Angle Side Relationship
316 ANS: 1 PTS: 2 REF: 061010ge STA: G.G.34
TOP: Angle Side Relationship

317 ANS: 4
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

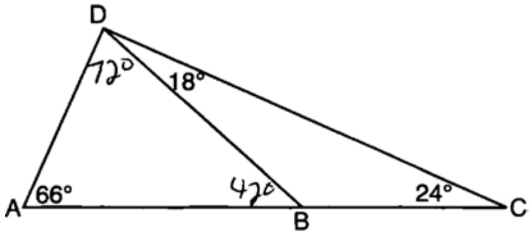
PTS: 2 REF: 081011ge STA: G.G.34 TOP: Angle Side Relationship

318 ANS: 4
$m\angle A = 80$

PTS: 2 REF: 011115ge STA: G.G.34 TOP: Angle Side Relationship

319 ANS: 4 PTS: 2 REF: 011222ge STA: G.G.34
TOP: Angle Side Relationship

320 ANS: 1



PTS: 2 REF: 081219ge STA: G.G.34 TOP: Angle Side Relationship

321 ANS: 4 PTS: 2 REF: 011607ge STA: G.G.34
TOP: Angle Side Relationship

322 ANS:
$x^2 + 12 + 11x + 5 + 13x - 17 = 180$. $m\angle A = 6^2 + 12 = 48$. $\angle B$ is the largest angle, so $\overline{AC}$ in the longest side.

$$x^2 + 24x - 180 = 0 \qquad m\angle B = 11(6) + 5 = 71$$
$$(x + 30)(x - 6) = 0 \qquad m\angle C = 13(6) - 7 = 61$$
$$x = 6$$

PTS: 4 REF: 011337ge STA: G.G.34 TOP: Angle Side Relationship

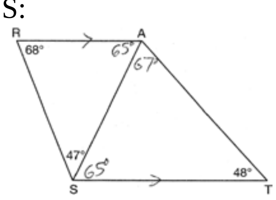
323 ANS: 2 PTS: 2 REF: 061321ge STA: G.G.34
TOP: Angle Side Relationship

324 ANS: 2 PTS: 2 REF: 081306ge STA: G.G.34
TOP: Angle Side Relationship

325 ANS: 1 PTS: 2 REF: 011416ge STA: G.G.34
TOP: Angle Side Relationship

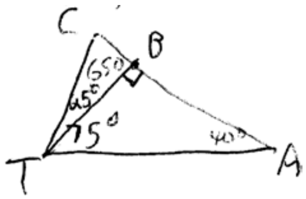
326 ANS:

$\overline{ST}$



PTS: 2 REF: 061430ge STA: G.G.34 TOP: Angle Side Relationship

327 ANS: 2



PTS: 2 REF: 081422ge STA: G.G.34 TOP: Angle Side Relationship

328 ANS: 2 PTS: 2 REF: 011510ge STA: G.G.34
TOP: Angle Side Relationship

329 ANS: 1 PTS: 2 REF: 061523ge STA: G.G.34
TOP: Angle Side Relationship

330 ANS: 1 PTS: 2 REF: 081524ge STA: G.G.34
TOP: Angle Side Relationship

331 ANS: 4

$\triangle ABC \sim \triangle DBE$. $\dfrac{\overline{AB}}{\overline{DB}} = \dfrac{\overline{AC}}{\overline{DE}}$

$$\frac{9}{2} = \frac{x}{3}$$

$$x = 13.5$$

PTS: 2 REF: 060927ge STA: G.G.46 TOP: Side Splitter Theorem

332 ANS:

5. $\dfrac{3}{x} = \dfrac{6+3}{15}$

$$9x = 45$$

$$x = 5$$

PTS: 2 REF: 011033ge STA: G.G.46 TOP: Side Splitter Theorem

333 ANS: 2

$$\frac{3}{7} = \frac{6}{x}$$

$$3x = 42$$

$$x = 14$$

PTS: 2 REF: 081027ge STA: G.G.46 TOP: Side Splitter Theorem

334 ANS: 4

$$\frac{x}{4}=\frac{x+x+3}{10}$$

$10x=8x+12$

$2x=12$

$x=6$

PTS: 2 REF: 011626ge STA: G.G.46 TOP: Side Splitter Theorem

335 ANS:

32. $\frac{16}{20}=\frac{x-3}{x+5}$. $\overline{AC}=x-3=35-3=32$

$16x+80=20x-60$

$140=4x$

$35=x$

PTS: 4 REF: 011137ge STA: G.G.46 TOP: Side Splitter Theorem

336 ANS:

16.7. $\frac{x}{25}=\frac{12}{18}$

$18x=300$

$x\approx 16.7$

PTS: 2 REF: 061133ge STA: G.G.46 TOP: Side Splitter Theorem

337 ANS: 3

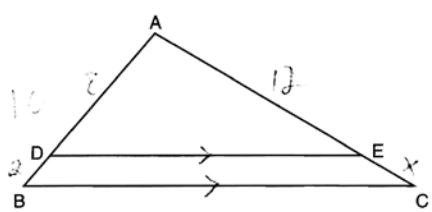
$$\frac{5}{7}=\frac{10}{x}$$

$5x=70$

$x=14$

PTS: 2 REF: 081103ge STA: G.G.46 TOP: Side Splitter Theorem

338 ANS: 3



$\frac{8}{2}=\frac{12}{x}$.

$8x=24$

$x=3$

PTS: 2 REF: 061216ge STA: G.G.46 TOP: Side Splitter Theorem

339 ANS: 3

$$\frac{12}{8} = \frac{21}{x} \quad 21 + 14 = 35$$

$$12x = 168$$

$$x = 14$$

PTS: 2 REF: 061426ge STA: G.G.46 TOP: Side Splitter Theorem

340 ANS: 2

$$\frac{3}{6} = \frac{5}{x}$$

$$3x = 30$$

$$x = 10$$

PTS: 2 REF: 081423ge STA: G.G.46 TOP: Side Splitter Theorem

341 ANS: 3

$$\frac{4}{6} = \frac{x+2}{4x-7}$$

$$16x - 28 = 6x + 12$$

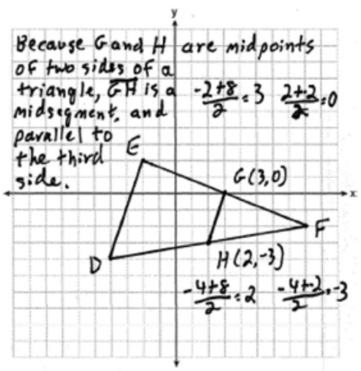
$$10x = 40$$

$$x = 4$$

PTS: 2 REF: 011521ge STA: G.G.46 TOP: Side Splitter Theorem

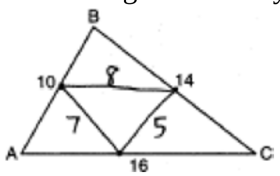
342 ANS: 3 PTS: 2 REF: 081507ge STA: G.G.46
TOP: Side Splitter Theorem

343 ANS:



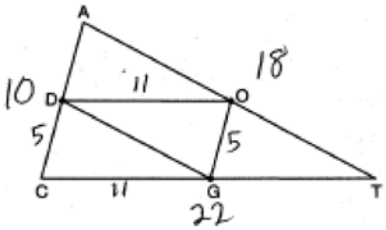
PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments

344 ANS:
20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5 + 7 + 8 = 20.$ 

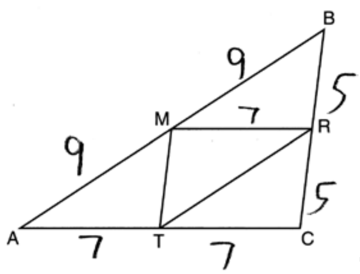
PTS: 2 REF: 060929ge STA: G.G.42 TOP: Midsegments

345 ANS: 3



PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

346 ANS: 1



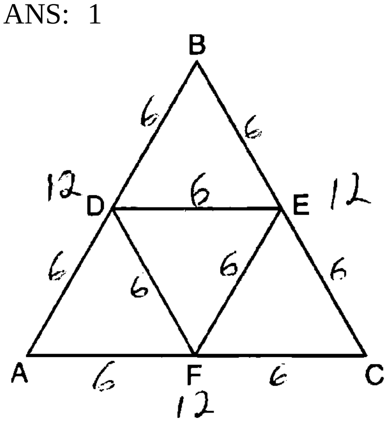
$7 + 7 + 5 + 7 + 9 = 35$

PTS: 2 REF: 011611ge STA: G.G.42 TOP: Midsegments

347 ANS:
37. Since $\overline{DE}$ is a midsegment, $AC = 14$. $10 + 13 + 14 = 37$

PTS: 2 REF: 061030ge STA: G.G.42 TOP: Midsegments

348 ANS: 1



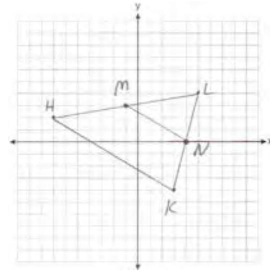
PTS: 2 REF: 081003ge STA: G.G.42 TOP: Midsegments

349 ANS: 2

$\frac{4x+10}{2} = 2x+5$

PTS: 2 REF: 011103ge STA: G.G.42 TOP: Midsegments

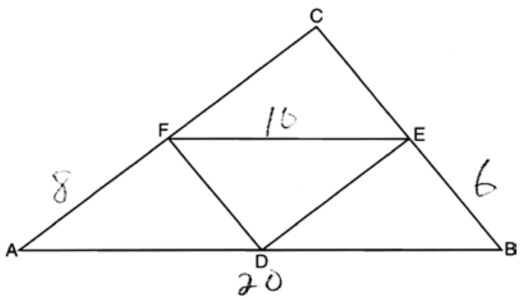
350 ANS:



$M\left(\frac{-7+5}{2}, \frac{2+4}{2}\right) = M(-1,3)$. $N\left(\frac{3+5}{2}, \frac{-4+4}{2}\right) = N(4,0)$. $\overline{MN}$ is a midsegment.

PTS: 4 REF: 011237ge STA: G.G.42 TOP: Midsegments

351 ANS: 4



$20+8+10+6=44$.

PTS: 2 REF: 061211ge STA: G.G.42 TOP: Midsegments

352 ANS: 3 PTS: 2 REF: 081227ge STA: G.G.42
TOP: Midsegments

353 ANS: 3 PTS: 2 REF: 011311ge STA: G.G.42
TOP: Midsegments

354 ANS: 3

$3x-15 = 2(6)$

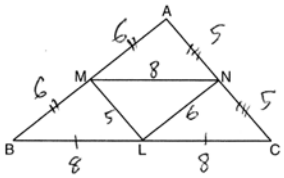
$3x = 27$

$x = 9$

PTS: 2 REF: 061311ge STA: G.G.42 TOP: Midsegments

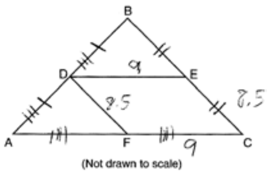
355 ANS: 3 PTS: 2 REF: 081320ge STA: G.G.42
TOP: Midsegments

356 ANS: 1



PTS: 2 REF: 011413ge STA: G.G.42 TOP: Midsegments

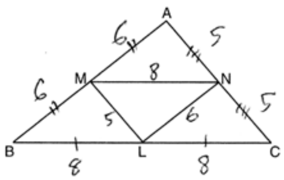
357 ANS:



$8.5 + 9 + 8.5 + 9 = 35$

PTS: 2 REF: 081430ge STA: G.G.42 TOP: Midsegments

358 ANS: 4



PTS: 2 REF: 061520ge STA: G.G.42 TOP: Midsegments

359 ANS:

$2x + 7 = 25$ $NT = 4.5$

$2x = 18$

$x = 9$

PTS: 2 REF: 081531ge STA: G.G.42 TOP: Midsegments

360 ANS: 3 PTS: 2 REF: fall0825ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

361 ANS: 4 PTS: 2 REF: 080925ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

362 ANS: 4

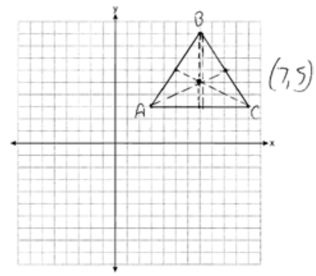
$\overline{BG}$ is also an angle bisector since it intersects the concurrence of $\overline{CD}$ and $\overline{AE}$

PTS: 2 REF: 061025ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

363 ANS: 1 PTS: 2 REF: 081028ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

364 ANS: 3 PTS: 2 REF: 011110ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

365 ANS:



$(7,5)$ $m_{\overline{AB}} = \left(\frac{3+7}{2}, \frac{3+9}{2}\right) = (5,6)$ $m_{\overline{BC}} = \left(\frac{7+11}{2}, \frac{9+3}{2}\right) = (9,6)$

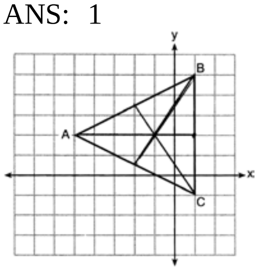
PTS: 2 REF: 081134ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

366 ANS: 3 PTS: 2 REF: 011202ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

367 ANS: 1 PTS: 2 REF: 061214ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

368 ANS: 4 PTS: 2 REF: 081224ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

369 ANS: 1



PTS: 2 REF: 011516ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

370 ANS:

$180 - \left(\frac{84}{2} + 28\right) = 180 - 70 = 110$

PTS: 2 REF: 061534ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

371 ANS: 2
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 060914ge STA: G.G.43 TOP: Centroid

372 ANS:
6. The centroid divides each median into segments whose lengths are in the ratio 2 : 1. $\overline{TD} = 6$ and $\overline{DB} = 3$

PTS: 2 REF: 011034ge STA: G.G.43 TOP: Centroid

373 ANS: 1
$2(2x - 6) = 24$

$2x - 6 = 12$

$2x = 18$

$x = 9$

PTS: 2 REF: 011619ge STA: G.G.43 TOP: Centroid

374 ANS: 1
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

$\overline{GC} = 2\overline{FG}$

$\overline{GC} + \overline{FG} = 24$

$2\overline{FG} + \overline{FG} = 24$

$3\overline{FG} = 24$

$\overline{FG} = 8$

PTS: 2 REF: 081018ge STA: G.G.43 TOP: Centroid

375 ANS: 1 PTS: 2 REF: 061104ge STA: G.G.43
TOP: Centroid

376 ANS: 1
$7x + 4 = 2(2x + 5)$. $PM = 2(2) + 5 = 9$

$7x + 4 = 4x + 10$

$3x = 6$

$x = 2$

PTS: 2 REF: 011226ge STA: G.G.43 TOP: Centroid

377 ANS: 4
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 081220ge STA: G.G.43 TOP: Centroid

378 ANS: 3
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 081307ge STA: G.G.43 TOP: Centroid

379 ANS: 1
$2x + x = 12$. $\overline{BD} = 2(4) = 8$

$3x = 12$

$x = 4$

PTS: 2 REF: 011408ge STA: G.G.43 TOP: Centroid

380 ANS: 3 PTS: 2 REF: 061424ge STA: G.G.43
TOP: Centroid

381 ANS:

$5x = 2(x+12)$ $QM = 5(8)+(8)+12 = 60$

$5x = 2x + 24$

$3x = 24$

$x = 8$

PTS: 2 REF: 081433ge STA: G.G.43 TOP: Centroid

382 ANS: 1 PTS: 2 REF: 061527ge STA: G.G.43
TOP: Centroid

383 ANS: 3

$2.4 + 2(2.4) = 7.2$

PTS: 2 REF: 081526ge STA: G.G.43 TOP: Centroid

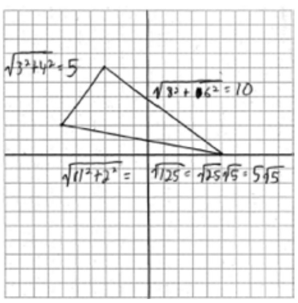
384 ANS: 1

Since $\overline{AC} \cong \overline{BC}$, $m\angle A = m\angle B$ under the Isosceles Triangle Theorem.

PTS: 2 REF: fall0809ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

385 ANS:

$15 + 5\sqrt{5}$.



PTS: 4 REF: 060936ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

386 ANS: 2 PTS: 2 REF: 061115ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

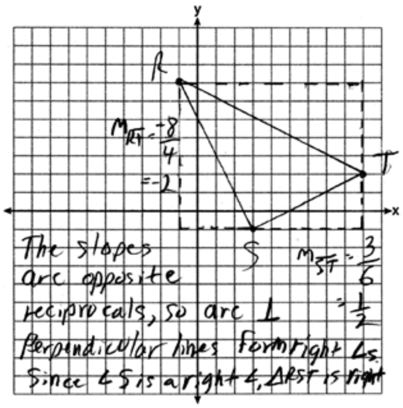
387 ANS: 2 PTS: 2 REF: 081226ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

388 ANS: 3

$AB = 8 - 4 = 4$. $BC = \sqrt{(-2-(-5))^2 + (8-6)^2} = \sqrt{13}$. $AC = \sqrt{(-2-(-5))^2 + (4-6)^2} = \sqrt{13}$

PTS: 2 REF: 011328ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

389 ANS:



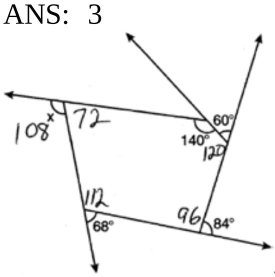
PTS: 4 REF: 011638ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

390 ANS:

$\sqrt{(7-3)^2+(-8-0)^2} = \sqrt{16+64} = \sqrt{80} = 4\sqrt{5}$

PTS: 2 REF: 061331ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

391 ANS: 3



. The sum of the interior angles of a pentagon is $(5-2)180 = 540$.

PTS: 2 REF: 011023ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

392 ANS: 4

sum of interior ∠s = sum of exterior ∠s

$$(n-2)180 = n\left(180 - \frac{(n-2)180}{n}\right)$$

$$180n - 360 = 180n - 180n + 360$$

$$180n = 720$$

$$n = 4$$

PTS: 2 REF: 081016ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

393 ANS: 3

$(n-2)180 = (5-2)180 = 540$

PTS: 2 REF: 011223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

394 ANS: 2

$$(n-2)180 = 1440$$
$$n-2 = 8$$
$$n = 10$$

PTS: 2 REF: 011618ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

395 ANS: 3 PTS: 2 REF: 061218ge STA: G.G.36
TOP: Interior and Exterior Angles of Polygons

396 ANS: 3

$$180(n-2) = n\left(180 - \frac{180(n-2)}{n}\right)$$
$$180n - 360 = 180n - 180n + 360$$
$$180n = 720$$
$$n = 4$$

PTS: 2 REF: 081223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

397 ANS: 4

$(n-2)180 = (8-2)180 = 1080.\ \dfrac{1080}{8} = 135.$

PTS: 2 REF: fall0827ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

398 ANS: 1

$\angle A = \dfrac{(n-2)180}{n} = \dfrac{(5-2)180}{5} = 108\ \ \angle AEB = \dfrac{180-108}{2} = 36$

PTS: 2 REF: 081022ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

399 ANS:

$(5-2)180 = 540.\ \dfrac{540}{5} = 108$ interior. $180 - 108 = 72$ exterior

PTS: 2 REF: 011131ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

400 ANS: 2

$(n-2)180 = (6-2)180 = 720.\ \dfrac{720}{6} = 120.$

PTS: 2 REF: 081125ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

401 ANS: 2

$$\frac{(n-2)180}{n} = 120 \ .$$

$$180n - 360 = 120n$$

$$60n = 360$$

$$n = 6$$

PTS: 2 REF: 011326ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

402 ANS:

$(n-2)180 = (8-2)180 = 1080.\ \frac{1080}{8} = 135.$

PTS: 2 REF: 061330ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

403 ANS: 4

$$(n-2)180 - n\left(\frac{(n-2)180}{n}\right) = 180n - 360 - 180n + 180n - 360 = 180n - 720.$$

$$180(5) - 720 = 180$$

PTS: 2 REF: 081322ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

404 ANS: 3

The regular polygon with the smallest interior angle is an equilateral triangle, with 60º. $180° - 60° = 120°$

PTS: 2 REF: 011417ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

405 ANS: 2

$$180 - \frac{(n-2)180}{n} = 45$$

$$180n - 180n + 360 = 45n$$

$$360 = 45n$$

$$n = 8$$

PTS: 2 REF: 061413ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

406 ANS:

$(n-2)180 = 540.\ \frac{540}{5} = 108$

$$n - 2 = 3$$

$$n = 5$$

PTS: 2 REF: 081434ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

407 ANS:

$$\frac{(n-2)180}{n} = \frac{(10-2)180}{10} = 144$$

PTS: 2 REF: 011531ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

408 ANS: 3

$$180-\frac{(n-2)180}{n}=40$$
$$180n-180n+360=40n$$
$$360=40n$$
$$n=9$$

PTS: 2 REF: 061519ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

409 ANS: 2

$$180(n-2)=720$$
$$n-2=4$$
$$n=6$$

PTS: 2 REF: 061521ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

410 ANS: 2

$(n-2)180=(8-2)180=1080.$ $\frac{1080}{8}=135.$

PTS: 2 REF: 081521ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

411 ANS: 1

$\angle DCB$ and $\angle ADC$ are supplementary adjacent angles of a parallelogram. $180-120=60.$ $\angle 2=60-45=15.$

PTS: 2 REF: 080907ge STA: G.G.38 TOP: Parallelograms

412 ANS: 1

Opposite sides of a parallelogram are congruent. $4x-3=x+3.$ $SV=(2)+3=5.$

$$3x=6$$
$$x=2$$

PTS: 2 REF: 011013ge STA: G.G.38 TOP: Parallelograms

413 ANS:

$$5x-2+3x+10=180$$
$$8x+8=180$$
$$8x=172$$
$$x=21.5$$

PTS: 4 REF: 011631ge STA: G.G.38 TOP: Parallelograms

414 ANS: 3 PTS: 2 REF: 011104ge STA: G.G.38
TOP: Parallelograms

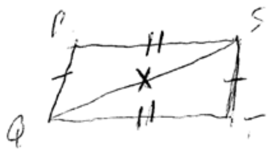
415 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms

416 ANS:
11. $x^2 + 6x = x + 14$. $6(2) - 1 = 11$

$$x^2 + 5x - 14 = 0$$
$$(x + 7)(x - 2) = 0$$
$$x = 2$$

PTS: 2 REF: 081235ge STA: G.G.38 TOP: Parallelograms

417 ANS: 3



PTS: 2 REF: 081402ge STA: G.G.38 TOP: Parallelograms

418 ANS: 2 PTS: 2 REF: 011522ge STA: G.G.38
TOP: Parallelograms

419 ANS:
$6x - 6 = 4x + 2$ $m\angle BCA = 4(4) + 2 = 18$ $7y - 15 = 5y - 1$ $m\angle BAC = 5(7) - 1 = 34$ $m\angle B = 180 - (18 + 34) = 128$

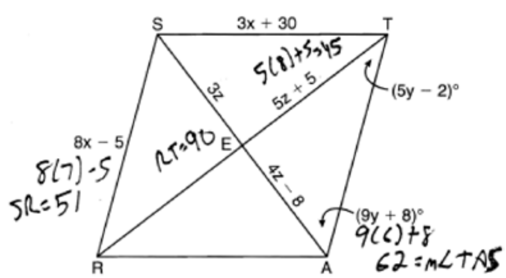
$$2x = 8 \qquad 2y = 14$$
$$x = 4 \qquad y = 7$$

PTS: 4 REF: 061536ge STA: G.G.38 TOP: Parallelograms

420 ANS: 2
$$L + L - 30 = 180$$
$$2L = 210$$
$$L = 105$$

PTS: 2 REF: 081519ge STA: G.G.38 TOP: Parallelograms

421 ANS:



$8x - 5 = 3x + 30$. $4z - 8 = 3z$. $9y + 8 + 5y - 2 = 90$.

$$5x = 35 \qquad z = 8 \qquad 14y + 6 = 90$$
$$x = 7 \qquad 14y = 84$$
$$y = 6$$

PTS: 6 REF: 061038ge STA: G.G.39 TOP: Special Parallelograms

422 ANS: 1 PTS: 2 REF: 011112ge STA: G.G.39
TOP: Special Parallelograms

423 ANS: 3

$\sqrt{5^2 + 12^2} = 13$

PTS: 2 REF: 061116ge STA: G.G.39 TOP: Special Parallelograms

424 ANS: 1 PTS: 2 REF: 061125ge STA: G.G.39
TOP: Special Parallelograms

425 ANS: 1 PTS: 2 REF: 081121ge STA: G.G.39
TOP: Special Parallelograms

426 ANS: 3 PTS: 2 REF: 081128ge STA: G.G.39
TOP: Special Parallelograms

427 ANS: 3

$6x + 4 = 2(7x - 6)$ $US = 6(2) + 4 = 16$

$6x + 4 = 14x - 12$

$16 = 8x$

$x = 2$

PTS: 2 REF: 011603ge STA: G.G.39 TOP: Special Parallelograms

428 ANS: 2

The diagonals of a rhombus are perpendicular. $180 - (90 + 12) = 78$

PTS: 2 REF: 011204ge STA: G.G.39 TOP: Special Parallelograms

429 ANS: 3 PTS: 2 REF: 061228ge STA: G.G.39
TOP: Special Parallelograms

430 ANS: 4

$2x - 8 = x + 2$. $AE = 10 + 2 = 12$. $AC = 2(AE) = 2(12) = 24$

$x = 10$

PTS: 2 REF: 011327ge STA: G.G.39 TOP: Special Parallelograms

431 ANS: 2

$\sqrt{8^2 + 15^2} = 17$

PTS: 2 REF: 061326ge STA: G.G.39 TOP: Special Parallelograms

432 ANS: 2

$s^2 + s^2 = (3\sqrt{2})^2$

$2s^2 = 18$

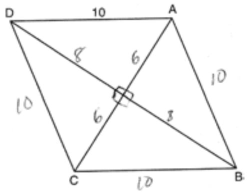
$s^2 = 9$

$s = 3$

PTS: 2 REF: 011420ge STA: G.G.39 TOP: Special Parallelograms

433 ANS: 3 PTS: 2 REF: 011425ge STA: G.G.39
TOP: Special Parallelograms

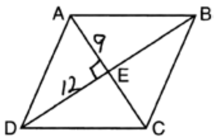
434 ANS: 2



PTS: 2 REF: 061414ge STA: G.G.39 TOP: Special Parallelograms

435 ANS: 3 PTS: 2 REF: 081419ge STA: G.G.39
TOP: Special Parallelograms

436 ANS: 1



$\sqrt{9^2 + 12^2} = 15$

PTS: 2 REF: 011505ge STA: G.G.39 TOP: Special Parallelograms

437 ANS: 3

Diagonals of rectangles and trapezoids do not bisect opposite angles. $m\angle DAB = 90$ if $ABCD$ is a square.

PTS: 2 REF: 061511ge STA: G.G.39 TOP: Special Parallelograms

438 ANS: 3

The diagonals of an isosceles trapezoid are congruent. $5x + 3 = 11x - 5$.

$$6x = 18$$

$$x = 3$$

PTS: 2 REF: fall0801ge STA: G.G.40 TOP: Trapezoids

439 ANS:

3. The non-parallel sides of an isosceles trapezoid are congruent. $2x + 5 = 3x + 2$

$$x = 3$$

PTS: 2 REF: 080929ge STA: G.G.40 TOP: Trapezoids

440 ANS: 2

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x + 30}{2} = 44$.

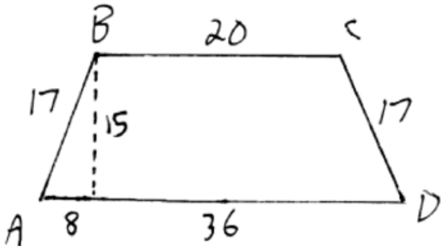
$$x + 30 = 88$$

$$x = 58$$

PTS: 2 REF: 011001ge STA: G.G.40 TOP: Trapezoids

441 ANS: 4 PTS: 2 REF: 061008ge STA: G.G.40
TOP: Trapezoids

442 ANS: 3



$\frac{36-20}{2} = 8.\ \sqrt{17^2 - 8^2} = 15$

PTS: 2 REF: 061016ge STA: G.G.40 TOP: Trapezoids

443 ANS:

70. $3x+5+3x+5+2x+2x=180$

$$\begin{aligned} 10x+10 &= 360 \\ 10x &= 350 \\ x &= 35 \\ 2x &= 70 \end{aligned}$$

PTS: 2 REF: 081029ge STA: G.G.40 TOP: Trapezoids

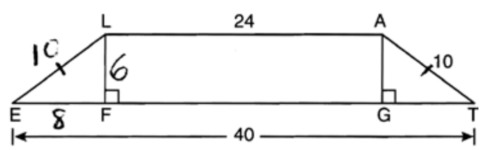
444 ANS: 4

$$\sqrt{25^2 - \left(\frac{26-12}{2}\right)^2} = 24$$

PTS: 2 REF: 011219ge STA: G.G.40 TOP: Trapezoids

445 ANS: 1

$\frac{40-24}{2} = 8.\ \sqrt{10^2 - 8^2} = 6.$



PTS: 2 REF: 061204ge STA: G.G.40 TOP: Trapezoids

446 ANS: 1

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+3+5x-9}{2} = 2x+2.$

$$\begin{aligned} 6x-6 &= 4x+4 \\ 2x &= 10 \\ x &= 5 \end{aligned}$$

PTS: 2 REF: 081221ge STA: G.G.40 TOP: Trapezoids

447 ANS: 3
$2(4x+20)+2(3x-15)=360$. $\angle D = 3(25)-15=60$

$$8x+40+6x-30=360$$
$$14x+10=360$$
$$14x=350$$
$$x=25$$

PTS: 2 REF: 011321ge STA: G.G.40 TOP: Trapezoids

448 ANS: 2
Isosceles or not, $\triangle RSV$ and $\triangle RST$ have a common base, and since $\overline{RS}$ and $\overline{VT}$ are bases, congruent altitudes.

PTS: 2 REF: 061301ge STA: G.G.40 TOP: Trapezoids

449 ANS:

$12x-4+7x+13=180$. $16y+1=\dfrac{12y+1+18y+6}{2}$

$$19x+9=180 \qquad 32y+2=30y+7$$
$$19x=171 \qquad 2y=5$$
$$x=9 \qquad y=\frac{5}{2}$$

PTS: 4 REF: 081337ge STA: G.G.40 TOP: Trapezoids

450 ANS: 3
$$\frac{x+7+3x+11}{2}=25$$
$$4x+18=50$$
$$4x=32$$
$$x=8$$

PTS: 2 REF: 011608ge STA: G.G.40 TOP: Trapezoids

451 ANS: 1
$180-123=57$

PTS: 2 REF: 061419ge STA: G.G.40 TOP: Trapezoids

452 ANS: 2
$5x+3=7x-15$ $5(9)+3=48$

$$18=2x$$
$$9=x$$

PTS: 2 REF: 011515ge STA: G.G.40 TOP: Trapezoids

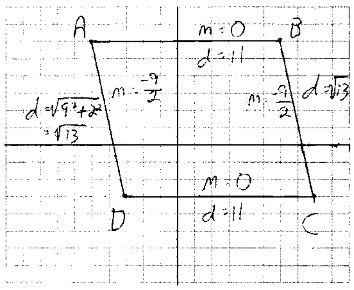
453 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41
TOP: Special Quadrilaterals

454 ANS: 1 PTS: 2 REF: 081517ge STA: G.G.41
TOP: Special Quadrilaterals

455 ANS: 2
Adjacent sides of a rectangle are perpendicular and have opposite and reciprocal slopes.

PTS: 2 REF: 061028ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

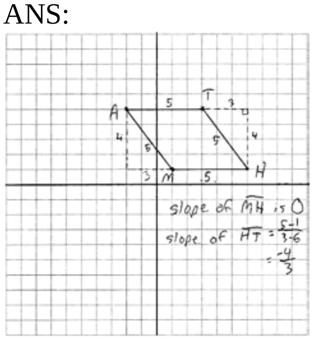
456 ANS:



$\overline{AB} \parallel \overline{CD}$ and $\overline{AD} \parallel \overline{CB}$ because their slopes are equal. *ABCD* is a parallelogram because opposite side are parallel. $\overline{AB} \neq \overline{BC}$. *ABCD* is not a rhombus because all sides are not equal. $\overline{AB} \sim \perp \overline{BC}$ because their slopes are not opposite reciprocals. *ABCD* is not a rectangle because $\angle ABC$ is not a right angle.

PTS: 4 REF: 081038ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

457 ANS:



The length of each side of quadrilateral is 5. Since each side is congruent, quadrilateral *MATH* is a rhombus. The slope of $\overline{MH}$ is 0 and the slope of $\overline{HT}$ is $-\frac{4}{3}$. Since the slopes are not negative reciprocals, the sides are not perpendicular and do not form rights angles. Since adjacent sides are not perpendicular, quadrilateral *MATH* is not a square.

PTS: 6 REF: 011138ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

458 ANS:

$m_{\overline{AB}} = \left(\frac{-6+2}{2}, \frac{-2+8}{2}\right) = D(2,3)$ $m_{\overline{BC}} = \left(\frac{2+6}{2}, \frac{8+-2}{2}\right) = E(4,3)$ $F(0,-2)$. To prove that *ADEF* is a parallelogram, show that both pairs of opposite sides of the parallelogram are parallel by showing the opposite sides have the same slope: $\text{m}_{\overline{AD}} = \frac{3--2}{-2--6} = \frac{5}{4}$ $\overline{AF} \parallel \overline{DE}$ because all horizontal lines have the same slope. *ADEF*

$$\text{m}_{FE} = \frac{3--2}{4-0} = \frac{5}{4}$$

is not a rhombus because not all sides are congruent. $AD = \sqrt{5^2+4^2} = \sqrt{41}$ $AF = 6$

PTS: 6 REF: 081138ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

459 ANS: 1

The diagonals of a parallelogram intersect at their midpoints. $M_{\overline{AC}}\left(\frac{1+3}{2}, \frac{5+(-1)}{2}\right) = (2,2)$

PTS: 2 REF: 061209ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

460 ANS: 2

$\sqrt{(-2-4)^2+(-3-(-1))^2} = \sqrt{40} = \sqrt{4}\sqrt{10} = 2\sqrt{10}$

PTS: 2 REF: 011313ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

461 ANS:

$m_{\overline{AB}} = \frac{4-1}{4-2} = \frac{3}{2}$. $m_{\overline{BC}} = -\frac{2}{3}$

PTS: 4 REF: 061334ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

462 ANS:

$M\left(\frac{-7+-3}{2},\frac{4+6}{2}\right)=M(-5,5)$. $m_{\overline{MN}}=\frac{5-3}{-5-0}=\frac{2}{-5}$. Since both opposite sides have equal slopes and are

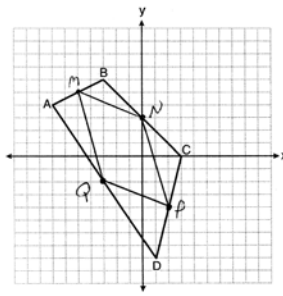
$N\left(\frac{-3+3}{2},\frac{6+0}{2}\right)=N(0,3)$ $\quad m_{\overline{PQ}}=\frac{-4--2}{2--3}=\frac{-2}{5}$

$P\left(\frac{3+1}{2},\frac{0+-8}{2}\right)=P(2,-4)$ $\quad m_{\overline{NA}}=\frac{3--4}{0-2}=\frac{7}{-2}$

$Q\left(\frac{-7+1}{2},\frac{4+-8}{2}\right)=Q(-3,-2)$ $\quad m_{\overline{QM}}=\frac{-2-5}{-3--5}=\frac{-7}{2}$

parallel, *MNPQ* is a parallelogram. $\overline{MN}=\sqrt{(-5-0)^2+(5-3)^2}=\sqrt{29}$. $\overline{MN}$ is not congruent to $\overline{NP}$, so *MNPQ*

$\overline{NA}=\sqrt{(0-2)^2+(3--4)^2}=\sqrt{53}$



is not a rhombus since not all sides are congruent.

PTS: 6 REF: 081338ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

463 ANS:

$m_{\overline{JM}}=\frac{1-4}{-3-3}=\frac{-3}{-6}=\frac{1}{2}$ Since both opposite sides have equal slopes and are parallel, *JKLM* is a parallelogram.

$m_{\overline{ML}}=\frac{4--2}{3-7}=\frac{6}{-4}=-\frac{3}{2}$

$m_{\overline{LK}}=\frac{-2--5}{7-1}=\frac{3}{6}=\frac{1}{2}$

$m_{\overline{KJ}}=\frac{-5-1}{1--3}=\frac{-6}{4}=-\frac{3}{2}$

$\overline{JM}=\sqrt{(-3-3)^2+(1-4)^2}=\sqrt{45}$. $\overline{JM}$ is not congruent to $\overline{ML}$, so *JKLM* is not a rhombus since not all sides

$\overline{ML}=\sqrt{(7-3)^2+(-2-4)^2}=\sqrt{52}$

are congruent.

PTS: 6 REF: 061438ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

464 ANS: 3

Both pairs of opposite sides are parallel, so not a trapezoid. None of the angles are right angles, so not a rectangle or square. All sides are congruent, so a rhombus.

PTS: 2 REF: 081411ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

465 ANS:

$$\left(\frac{0+1}{2},\frac{4+-4}{2}\right)$$

$$\left(\frac{1}{2},0\right)$$

PTS: 2 REF: 081534ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

466 ANS: 3

Because $\overline{OC}$ is a radius, its length is 5. Since $CE = 2$ $OE = 3$. $\triangle EDO$ is a 3-4-5 triangle. If $ED = 4$, $BD = 8$.

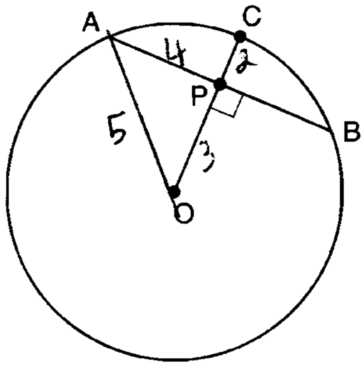
PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

467 ANS: 1

The closer a chord is to the center of a circle, the longer the chord.

PTS: 2 REF: 011005ge STA: G.G.49 TOP: Chords

468 ANS: 3



PTS: 2 REF: 011112ge STA: G.G.49 TOP: Chords

469 ANS: 4

$$\sqrt{6^2-2^2}=\sqrt{32}=\sqrt{16}\sqrt{2}=4\sqrt{2}$$

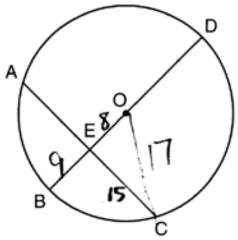
PTS: 2 REF: 081124ge STA: G.G.49 TOP: Chords

470 ANS:

$EO = 6$. $CE = \sqrt{10^2-6^2} = 8$

PTS: 2 REF: 011234ge STA: G.G.49 TOP: Chords

471 ANS: 2



$\sqrt{17^2 - 15^2} = 8.\ \ 17 - 8 = 9$

PTS: 2 REF: 061221ge STA: G.G.49 TOP: Chords

472 ANS: 3 PTS: 2 REF: 011322ge STA: G.G.49
TOP: Chords

473 ANS:

$2(y + 10) = 4y - 20.\ \ \overline{DF} = y + 10 = 20 + 10 = 30.\ \ \overline{OA} = \overline{OD} = \sqrt{16^2 + 30^2} = 34$

$2y + 20 = 4y - 20$

$40 = 2y$

$20 = y$

PTS: 4 REF: 061336ge STA: G.G.49 TOP: Chords

474 ANS: 4 PTS: 2 REF: 081308ge STA: G.G.49
TOP: Chords

475 ANS: 2

$\sqrt{17^2 - 15^2} = \sqrt{289 - 225} = \sqrt{64} = 8$

PTS: 2 REF: 011424ge STA: G.G.49 TOP: Chords

476 ANS: 4 PTS: 2 REF: 081403ge STA: G.G.49
TOP: Chords

477 ANS: 2

Parallel chords intercept congruent arcs. $\text{m}\overset{\frown}{AD} = \text{m}\overset{\frown}{BC} = 60$. $\text{m}\angle CDB = \frac{1}{2}\text{m}\overset{\frown}{BC} = 30$.

PTS: 2 REF: 060906ge STA: G.G.52 TOP: Chords and Secants

478 ANS: 2

Parallel chords intercept congruent arcs. $\text{m}\overset{\frown}{AC} = \text{m}\overset{\frown}{BD} = 30$. $180 - 30 - 30 = 120$.

PTS: 2 REF: 080904ge STA: G.G.52 TOP: Chords and Secants

479 ANS: 1
Parallel lines intercept congruent arcs.

PTS: 2 REF: 061001ge STA: G.G.52 TOP: Chords and Secants

480 ANS: 1
Parallel lines intercept congruent arcs.

PTS: 2 REF: 061105ge STA: G.G.52 TOP: Chords and Secants

481 ANS:
$\frac{180-80}{2}=50$

PTS: 2 REF: 081129ge STA: G.G.52 TOP: Chords and Secants

482 ANS:
$2x-20=x+20.$ $\text{m}\overset{\frown}{AB}=x+20=40+20=60$

$x=40$

PTS: 2 REF: 011229ge STA: G.G.52 TOP: Chords and Secants

483 ANS: 3
$\frac{180-70}{2}=55$

PTS: 2 REF: 061205ge STA: G.G.52 TOP: Chords and Secants

484 ANS: 4
Parallel lines intercept congruent arcs.

PTS: 2 REF: 081201ge STA: G.G.52 TOP: Chords and Secants

485 ANS: 2
Parallel chords intercept congruent arcs. $\frac{360-(104+168)}{2}=44$

PTS: 2 REF: 011302ge STA: G.G.52 TOP: Chords and Secants

486 ANS: 1
Parallel chords intercept congruent arcs. $\text{m}\overset{\frown}{AC}=\text{m}\overset{\frown}{BD}$. $\frac{180-110}{2}=35.$

PTS: 2 REF: 081302ge STA: G.G.52 TOP: Chords and Secants

487 ANS: 3
Parallel lines intercept congruent arcs.

PTS: 2 REF: 061409ge STA: G.G.52 TOP: Chords and Secants

488 ANS: 1
Parallel lines intercept congruent arcs.

PTS: 2 REF: 081413ge STA: G.G.52 TOP: Chords and Secants

489 ANS: 2 PTS: 2 REF: 011616ge STA: G.G.52
TOP: Chords and Secants

490 ANS: 4
$9x-10=5x+30$ $5(10)+30=80$

$4x=40$

$x=10$

PTS: 2 REF: 011525ge STA: G.G.52 TOP: Chords and Secants

491 ANS: 2 PTS: 2 REF: 061516ge STA: G.G.52
TOP: Chords and Secants

492 ANS: 2

Parallel secants intercept congruent arcs. $\frac{360-(106+24)}{2}=\frac{230}{2}=115$

PTS: 2 REF: 081503ge STA: G.G.52 TOP: Chords and Secants

493 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
TOP: Tangents KEY: common tangency

494 ANS:

18. If the ratio of *TA* to *AC* is 1:3, the ratio of *TE* to *ES* is also 1:3. $x+3x=24$. $3(6)=18$.

$x=6$

PTS: 4 REF: 060935ge STA: G.G.50 TOP: Tangents
KEY: common tangency

495 ANS: 3 PTS: 2 REF: 080928ge STA: G.G.50
TOP: Tangents KEY: common tangency

496 ANS: 1 PTS: 2 REF: 061013ge STA: G.G.50
TOP: Tangents KEY: point of tangency

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

497 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50
TOP: Tangents KEY: two tangents

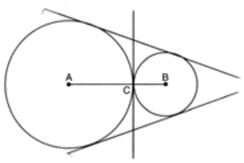
498 ANS: 4

$\sqrt{25^2 - 7^2} = 24$

PTS: 2 REF: 081105ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

499 ANS: 2 PTS: 2 REF: 081214ge STA: G.G.50
TOP: Tangents KEY: point of tangency

500 ANS:



PTS: 2 REF: 011330ge STA: G.G.50 TOP: Tangents
KEY: common tangency

501 ANS: 2

$\sqrt{15^2 - 12^2} = 9$

PTS: 2 REF: 081325ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

502 ANS: 3

$180 - 38 = 142$

PTS: 2 REF: 011419ge STA: G.G.50 TOP: Tangents
KEY: two tangents

503 ANS: 2

$180 - 2(66) = 48$

PTS: 2 REF: 061513ge STA: G.G.50 TOP: Tangents
KEY: two tangents

504 ANS: 4 PTS: 2 REF: 011428ge STA: G.G.50
TOP: Tangents KEY: common tangency

505 ANS:

$x^2 + 7^2 = 25^2$

$x^2 + 49 = 625$

$x^2 = 576$

$x = 24$

PTS: 2 REF: 061433ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

506 ANS: 3

$\sqrt{20^2 + 7^2} \approx 21$

PTS: 2 REF: 081525ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

507 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°. $\text{m}\overset{\frown}{FE} = \frac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by $\overset{\frown}{FE}$, their measure is 24°. $\text{m}\overset{\frown}{GD} = \frac{7}{15} \times 360 = 168$. Since the chords forming $\angle E$ and $\angle F$ are intercepted by $\overset{\frown}{GD}$, their measure is 84°.

PTS: 4 REF: fall0836ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

508 ANS: 2

$\frac{87 + 35}{2} = \frac{122}{2} = 61$

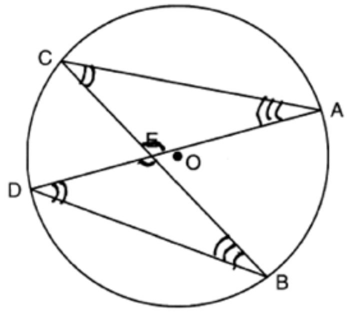
PTS: 2 REF: 011015ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

509 ANS: 3

$\frac{36 + 20}{2} = 28$

PTS: 2 REF: 061019ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

510 ANS: 2



PTS: 2 REF: 061026ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

511 ANS: 2

$$\frac{140-\overline{RS}}{2}=40$$

$$140-\overline{RS}=80$$

$$\overline{RS}=60$$

PTS: 2 REF: 081025ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

512 ANS: 4 PTS: 2 REF: 011124ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

513 ANS:

30. $3x+4x+5x=360$. $m\overset{\frown}{LN}:m\overset{\frown}{NK}:m\overset{\frown}{KL}=90:120:150$. $\frac{150-90}{2}=30$

$x=20$

PTS: 4 REF: 061136ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

514 ANS: 2 PTS: 2 REF: 011602ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

515 ANS: 2

$$\frac{50+x}{2}=34$$

$$50+x=68$$

$$x=18$$

PTS: 2 REF: 011214ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

516 ANS:

52, 40, 80. $360-(56+112)=192$. $\frac{192-112}{2}=40$. $\frac{112+48}{2}=80$

$\frac{1}{4}\times 192=48$

$\frac{56+48}{2}=52$

PTS: 6 REF: 081238ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: mixed

517 ANS: 1

$\frac{70-20}{2}=25$

PTS: 2 REF: 011325ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

518 ANS: 2 PTS: 2 REF: 061322ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

519 ANS:

$86°\cdot 2=172°$ $180°-86°=94°$

PTS: 2 REF: 081432ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

520 ANS: 3 PTS: 2 REF: 011523ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

521 ANS: 1 PTS: 2 REF: 081518ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

522 ANS: 2

$$x^2=3(x+18)$$
$$x^2-3x-54=0$$
$$(x-9)(x+6)=0$$
$$x=9$$

PTS: 2 REF: fall0817ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

523 ANS: 3

$$4(x+4)=8^2$$
$$4x+16=64$$
$$x=12$$

PTS: 2 REF: 060916ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

524 ANS: 2

$$4(4x-3)=3(2x+8)$$
$$16x-12=6x+24$$
$$10x=36$$
$$x=3.6$$

PTS: 2 REF: 080923ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

525 ANS: 4

$$x^2=(4+5)\times 4$$
$$x^2=36$$
$$x=6$$

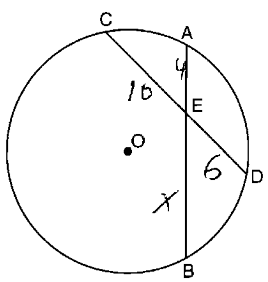
PTS: 2 REF: 011008ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

526 ANS: 2

$$(d+4)4=12(6)$$
$$4d+16=72$$
$$d=14$$
$$r=7$$

PTS: 2 REF: 061023ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

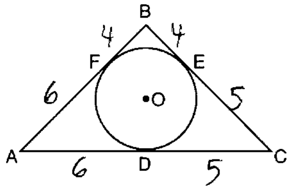
527 ANS: 1



$$4x=6\cdot 10$$
$$x=15$$

PTS: 2 REF: 081017ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

528 ANS: 3



PTS: 2 REF: 011101ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two tangents

529 ANS:

$$x^2 = 9 \cdot 8$$
$$x = \sqrt{72}$$
$$x = \sqrt{36}\sqrt{2}$$
$$x = 6\sqrt{2}$$

PTS: 2 REF: 011132ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

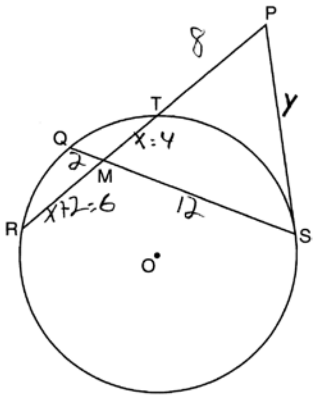
530 ANS: 4

$$4(x+4) = 8^2$$
$$4x + 16 = 64$$
$$4x = 48$$
$$x = 12$$

PTS: 2 REF: 061117ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

531 ANS: 4 PTS: 2 REF: 011208ge STA: G.G.53
TOP: Segments Intercepted by Circle KEY: two tangents

532 ANS:



$x(x+2) = 12 \cdot 2$. $\overline{RT} = 6 + 4 = 10$. $y \cdot y = 18 \cdot 8$

$x^2 + 2x - 24 = 0$ $\quad y^2 = 144$

$(x+6)(x-4) = 0$ $\quad y = 12$

$x = 4$

PTS: 4 REF: 061237ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

533 ANS: 1

$12(8) = x(6)$

$96 = 6x$

$16 = x$

PTS: 2 REF: 061328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

534 ANS: 1

$8 \times 12 = 16x$

$6 = x$

PTS: 2 REF: 081328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

535 ANS:

$24 \cdot 6 = w \cdot 8$

$144 = 8w$

$18 = w$

PTS: 2 REF: 011533ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

536 ANS: 1

$M_x = \frac{-2+6}{2} = 2$. $M_y = \frac{3+3}{2} = 3$. The center is (2,3). $d = \sqrt{(-2-6)^2 + (3-3)^2} = \sqrt{64+0} = 8$. If the diameter is 8, the radius is 4 and $r^2 = 16$.

PTS: 2 REF: fall0820ge STA: G.G.71 TOP: Equations of Circles

537 ANS: 2 PTS: 2 REF: 060910ge STA: G.G.71 TOP: Equations of Circles

538 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71 TOP: Equations of Circles

539 ANS:

Midpoint: $\left(\frac{-4+4}{2}, \frac{2+(-4)}{2}\right) = (0,-1)$. Distance: $d = \sqrt{(-4-4)^2 + (2-(-4))^2} = \sqrt{100} = 10$

$r = 5$

$r^2 = 25$

$x^2 + (y+1)^2 = 25$

PTS: 4 REF: 061037ge STA: G.G.71 TOP: Equations of Circles

540 ANS: 2 PTS: 2 REF: 011601ge STA: G.G.71 TOP: Equations of Circles

541 ANS: 3 PTS: 2 REF: 011116ge STA: G.G.71 TOP: Equations of Circles

542 ANS: 4 PTS: 2 REF: 081110ge STA: G.G.71 TOP: Equations of Circles

543 ANS: 4 PTS: 2 REF: 011212ge STA: G.G.71 TOP: Equations of Circles

544 ANS: 3 PTS: 2 REF: 061210ge STA: G.G.71 TOP: Equations of Circles

545 ANS: 3 PTS: 2 REF: 081209ge STA: G.G.71 TOP: Equations of Circles

546 ANS:

If $r = 5$, then $r^2 = 25$. $(x+3)^2 + (y-2)^2 = 25$

PTS: 2 REF: 011332ge STA: G.G.71 TOP: Equations of Circles

547 ANS: 3 PTS: 2 REF: 061306ge STA: G.G.71 TOP: Equations of Circles

548 ANS: 4 PTS: 2 REF: 081305ge STA: G.G.71 TOP: Equations of Circles

549 ANS: 1 PTS: 2 REF: 011423ge STA: G.G.71 TOP: Equations of Circles

550 ANS: 1

$$\left(\frac{2+2}{2},\frac{0+(-8)}{2}\right)=(2,-4)\quad \sqrt{(2-2)^2+(-8-0)^2}=8=d$$
$$4=r$$
$$16=r^2$$

PTS: 2 REF: 061428ge STA: G.G.71 TOP: Equations of Circles

551 ANS: 2 PTS: 2 REF: 011511ge STA: G.G.71 TOP: Equations of Circles

552 ANS: 2 PTS: 2 REF: 061524ge STA: G.G.71 TOP: Equations of Circles

553 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72 TOP: Equations of Circles

554 ANS: 4

The radius is 4. $r^2=16$.

PTS: 2 REF: 061014ge STA: G.G.72 TOP: Equations of Circles

555 ANS:

$(x+1)^2+(y-2)^2=36$

PTS: 2 REF: 081034ge STA: G.G.72 TOP: Equations of Circles

556 ANS: 1 PTS: 2 REF: 061110ge STA: G.G.72 TOP: Equations of Circles

557 ANS:

$(x-5)^2+(y+4)^2=36$

PTS: 2 REF: 081132ge STA: G.G.72 TOP: Equations of Circles

558 ANS: 1 PTS: 2 REF: 011220ge STA: G.G.72 TOP: Equations of Circles

559 ANS: 2 PTS: 2 REF: 081212ge STA: G.G.72 TOP: Equations of Circles

560 ANS: 4 PTS: 2 REF: 011323ge STA: G.G.72 TOP: Equations of Circles

561 ANS: 3 PTS: 2 REF: 061309ge STA: G.G.72 TOP: Equations of Circles

562 ANS: 3 PTS: 2 REF: 081312ge STA: G.G.72 TOP: Equations of Circles

563 ANS: 4 PTS: 2 REF: 011415ge STA: G.G.72 TOP: Equations of Circles

564 ANS: 1 PTS: 2 REF: 061408ge STA: G.G.72 TOP: Equations of Circles

565 ANS: 4 PTS: 2 REF: 081409ge STA: G.G.72 TOP: Equations of Circles

566 ANS: 3 PTS: 2 REF: 011514ge STA: G.G.72 TOP: Equations of Circles

567 ANS: 1 PTS: 2 REF: 061510ge STA: G.G.72
TOP: Equations of Circles

568 ANS: 2 PTS: 2 REF: 081520ge STA: G.G.72
TOP: Equations of Circles

569 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73
TOP: Equations of Circles

570 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles

571 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73
TOP: Equations of Circles

572 ANS: 1 PTS: 2 REF: 081009ge STA: G.G.73
TOP: Equations of Circles

573 ANS: 4 PTS: 2 REF: 061114ge STA: G.G.73
TOP: Equations of Circles

574 ANS: 2 PTS: 2 REF: 011203ge STA: G.G.73
TOP: Equations of Circles

575 ANS: 1 PTS: 2 REF: 061223ge STA: G.G.73
TOP: Equations of Circles

576 ANS: 4 PTS: 2 REF: 011318ge STA: G.G.73
TOP: Equations of Circles

577 ANS: 4 PTS: 2 REF: 061319ge STA: G.G.73
TOP: Equations of Circles

578 ANS:

center: $(3,-4)$; radius: $\sqrt{10}$

PTS: 2 REF: 081333ge STA: G.G.73 TOP: Equations of Circles

579 ANS: 4 PTS: 2 REF: 011403ge STA: G.G.73
TOP: Equations of Circles

580 ANS: 4 PTS: 2 REF: 011426ge STA: G.G.73
TOP: Equations of Circles

581 ANS: 4 PTS: 2 REF: 061422ge STA: G.G.73
TOP: Equations of Circles

582 ANS: 1

$r^2 = 48$

$r = \sqrt{48} = \sqrt{16} \cdot \sqrt{3} = 4\sqrt{3}$

PTS: 2 REF: 081412ge STA: G.G.73 TOP: Equations of Circles

583 ANS: 3

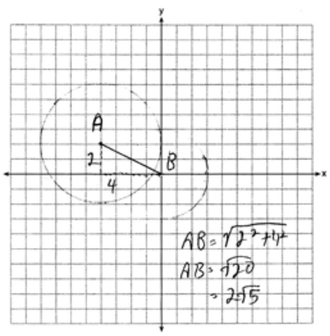
$r^2 = 50$

$r = \sqrt{50} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$

PTS: 2 REF: 061515ge STA: G.G.73 TOP: Equations of Circles

584 ANS: 3 PTS: 2 REF: 081502ge STA: G.G.73
TOP: Equations of Circles

585 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles
586 ANS: 2 PTS: 2 REF: 011020ge STA: G.G.74
TOP: Graphing Circles
587 ANS: 2 PTS: 2 REF: 011125ge STA: G.G.74
TOP: Graphing Circles
588 ANS: 3 PTS: 2 REF: 061220ge STA: G.G.74
TOP: Graphing Circles
589 ANS: 1 PTS: 2 REF: 061325ge STA: G.G.74
TOP: Graphing Circles
590 ANS: 1 PTS: 2 REF: 081324ge STA: G.G.74
TOP: Graphing Circles
591 ANS: 2 PTS: 2 REF: 081425ge STA: G.G.74
TOP: Graphing Circles
592 ANS: 3 PTS: 2 REF: 011518ge STA: G.G.74
TOP: Graphing Circles
593 ANS: 1 PTS: 2 REF: 011614ge STA: G.G.74
TOP: Graphing Circles
594 ANS:



PTS: 4 REF: 081537ge STA: G.G.74 TOP: Graphing Circles
595 ANS:
4. $l_1 w_1 h_1 = l_2 w_2 h_2$

$$10 \times 2 \times h = 5 \times w_2 \times h$$
$$20 = 5w_2$$
$$w_2 = 4$$

PTS: 2 REF: 011030ge STA: G.G.11 TOP: Volume
596 ANS: 3

$$25 \times 9 \times 12 = 15^2 h$$
$$2700 = 15^2 h$$
$$12 = h$$

PTS: 2 REF: 061323ge STA: G.G.11 TOP: Volume

597 ANS: 1
If two prisms have equal heights and volume, the area of their bases is equal.

PTS: 2 REF: 081321ge STA: G.G.11 TOP: Volume
598 ANS:
$$5 \cdot 5 = 10w$$
$$25 = 10w$$
$$2.5 = w$$

PTS: 2 REF: 061432ge STA: G.G.11 TOP: Volume
599 ANS: 3
$$720 = 5B$$
$$144 = B$$

PTS: 2 REF: 081523ge STA: G.G.11 TOP: Volume
600 ANS: 1
$$\frac{3x^2 + 18x + 24}{3(x+2)}$$
$$\frac{3(x^2 + 6x + 8)}{3(x+2)}$$
$$\frac{3(x+4)(x+2)}{3(x+2)}$$
$$x + 4$$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume
601 ANS:
9.1. $(11)(8)h = 800$
$$h \approx 9.1$$

PTS: 2 REF: 061131ge STA: G.G.12 TOP: Volume
602 ANS: 3 PTS: 2 REF: 081123ge STA: G.G.12
TOP: Volume
603 ANS: 2 PTS: 2 REF: 011215ge STA: G.G.12
TOP: Volume
604 ANS:
$V = 20 \times 8 = 160$

PTS: 2 REF: 011633ge STA: G.G.12 TOP: Volume

605 ANS:

$Bh = V$

$12h = 84$

$h = 7$

PTS: 2 REF: 011432ge STA: G.G.12 TOP: Volume

606 ANS:

2016. $V = \frac{1}{3}Bh = \frac{1}{3}s^2h = \frac{1}{3}12^2 \cdot 42 = 2016$

PTS: 2 REF: 080930ge STA: G.G.13 TOP: Volume

607 ANS:

18. $V = \frac{1}{3}Bh = \frac{1}{3}lwh$

$288 = \frac{1}{3} \cdot 8 \cdot 6 \cdot h$

$288 = 16h$

$18 = h$

PTS: 2 REF: 061034ge STA: G.G.13 TOP: Volume

608 ANS: 1

$256 = \frac{1}{3}B \cdot 12$

$64 = B$

$8 = s$

PTS: 2 REF: 081428ge STA: G.G.13 TOP: Volume

609 ANS:

22.4. $V = \pi r^2 h$

$12566.4 = \pi r^2 \cdot 8$

$r^2 = \frac{12566.4}{8\pi}$

$r \approx 22.4$

PTS: 2 REF: fall0833ge STA: G.G.14 TOP: Volume and Lateral Area

610 ANS: 1

$$V = \pi r^2 h$$
$$1000 = \pi r^2 \cdot 8$$
$$r^2 = \frac{1000}{8\pi}$$
$$r \approx 6.3$$

PTS: 2 REF: 080926ge STA: G.G.14 TOP: Volume and Lateral Area

611 ANS: 3

$V = \pi r^2 h = \pi \cdot 6^2 \cdot 27 = 972\pi$

PTS: 2 REF: 011027ge STA: G.G.14 TOP: Volume and Lateral Area

612 ANS: 4

$L = 2\pi rh = 2\pi \cdot 5 \cdot 11 \approx 345.6$

PTS: 2 REF: 061006ge STA: G.G.14 TOP: Volume and Lateral Area

613 ANS: 2

$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 = 540\pi$

PTS: 2 REF: 011117ge STA: G.G.14 TOP: Volume and Lateral Area

614 ANS:

$$V = \pi r^2 h$$
$$600\pi = \pi r^2 \cdot 12$$
$$50 = r^2$$
$$\sqrt{25}\sqrt{2} = r$$
$$5\sqrt{2} = r$$

. $L = 2\pi rh = 2\pi \cdot 5\sqrt{2} \cdot 12 \approx 533.1$

PTS: 4 REF: 011236ge STA: G.G.14 TOP: Volume and Lateral Area

615 ANS:

$L = 2\pi rh = 2\pi \cdot 12 \cdot 22 \approx 1659$. $\frac{1659}{600} \approx 2.8$. 3 cans are needed.

PTS: 2 REF: 061233ge STA: G.G.14 TOP: Volume and Lateral Area

616 ANS:

$V = \pi r^2 h = \pi(5)^2 \cdot 7 = 175\pi$

PTS: 2 REF: 081231ge STA: G.G.14 TOP: Volume and Lateral Area

617 ANS:

$L = 2\pi rh = 2\pi \cdot 3 \cdot 5 \approx 94.25$. $V = \pi r^2 h = \pi(3)^2(5) \approx 141.37$

PTS: 4 REF: 011335ge STA: G.G.14 TOP: Volume and Lateral Area

618 ANS:
$L = 2\pi rh = 2\pi \cdot 3 \cdot 7 = 42\pi$

PTS: 2 REF: 061329ge STA: G.G.14 TOP: Volume and Lateral Area

619 ANS: 2
$18\pi \cdot 42 \approx 2375$

PTS: 2 REF: 011418ge STA: G.G.14 TOP: Volume and Lateral Area

620 ANS: 3
$L = 2\pi rh = 2\pi \cdot \frac{6}{2} \cdot 15 = 90\pi$

PTS: 2 REF: 061405ge STA: G.G.14 TOP: Volume and Lateral Area

621 ANS: 1
$V = \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi \cdot 4^2 \cdot 12 \approx 201$

PTS: 2 REF: 060921ge STA: G.G.15 TOP: Volume

622 ANS:
375π $L = \pi r l = \pi(15)(25) = 375\pi$

PTS: 2 REF: 081030ge STA: G.G.15 TOP: Lateral Area

623 ANS: 3
$120\pi = \pi(12)(l)$

$10 = l$

PTS: 2 REF: 081314ge STA: G.G.15 TOP: Volume and Lateral Area

624 ANS: 1
$V = \frac{1}{3}\pi \cdot \left(5\sqrt{2}\right)^2 \cdot 12 = 200\pi$

PTS: 2 REF: 011623ge STA: G.G.15 TOP: Volume and Lateral Area

625 ANS:
$l = \sqrt{10^2 + 3^2} = \sqrt{109}$ $L = \pi r l = \pi(3)(\sqrt{109}) \approx 98.4$

PTS: 4 REF: 081436ge STA: G.G.15 TOP: Volume and Lateral Area

626 ANS:
$h = \sqrt{5^2 - 3^2} = 4$ $V = \frac{1}{3}\pi \cdot 3^2 \cdot 4 = 12\pi$ $V = \pi \cdot 4^2 \cdot 6 = 96\pi$ $\frac{96\pi}{12\pi} = 8$

PTS: 4 REF: 011537ge STA: G.G.15 TOP: Volume and Lateral Area

627 ANS:
$l = \sqrt{12^2 + 5^2} = \sqrt{169} = 13$ $L = \pi r l = \pi(5)(13) = 65\pi$

PTS: 2 REF: 061531ge STA: G.G.15 TOP: Volume and Lateral Area

628 ANS:

$V = \frac{1}{3}\pi(3^2)(8) = 24\pi$

PTS: 2 REF: 081530ge STA: G.G.15 TOP: Volume and Lateral Area

629 ANS:

452. $SA = 4\pi r^2 = 4\pi \cdot 6^2 = 144\pi \approx 452$

PTS: 2 REF: 061029ge STA: G.G.16 TOP: Volume and Surface Area

630 ANS: 4

$\text{SA} = 4\pi r^2 \quad V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 6^3 = 288\pi$

$144\pi = 4\pi r^2$

$36 = r^2$

$6 = r$

PTS: 2 REF: 081020ge STA: G.G.16 TOP: Surface Area

631 ANS: 2

$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 3^3 = 36\pi$

PTS: 2 REF: 061112ge STA: G.G.16 TOP: Volume and Surface Area

632 ANS:

$V = \frac{4}{3}\pi \cdot 9^3 = 972\pi$

PTS: 2 REF: 081131ge STA: G.G.16 TOP: Volume and Surface Area

633 ANS: 2

$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot \left(\frac{15}{2}\right)^3 \approx 1767.1$

PTS: 2 REF: 061207ge STA: G.G.16 TOP: Volume and Surface Area

634 ANS: 2

$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot \left(\frac{6}{2}\right)^3 \approx 36\pi$

PTS: 2 REF: 081215ge STA: G.G.16 TOP: Volume and Surface Area

635 ANS: 1

$$V = \frac{4}{3}\pi r^3$$

$$44.6022 = \frac{4}{3}\pi r^3$$

$$10.648 \approx r^3$$

$$2.2 \approx r$$

PTS: 2 REF: 061317ge STA: G.G.16 TOP: Volume and Surface Area

636 ANS:

$SA = 4\pi r^2 = 4\pi \cdot 2.5^2 = 25\pi \approx 78.54$

PTS: 2 REF: 011429ge STA: G.G.16 TOP: Volume and Surface Area

637 ANS: 3

$$144\pi = 4\pi r^2$$

$$36 = r^2$$

$$6 = r$$

PTS: 2 REF: 061415ge STA: G.G.16 TOP: Volume and Surface Area

638 ANS: 2

$$2304\pi = 4\pi r^2$$

$$576 = r^2$$

$$24 = r$$

PTS: 2 REF: 011606ge STA: G.G.16 TOP: Volume and Surface Area

639 ANS: 3

$$V = \frac{2}{3}\pi\left(\frac{12}{2}\right)^3 \approx 905$$

PTS: 2 REF: 061502ge STA: G.G.16 TOP: Volume and Surface Area

640 ANS: 4

Corresponding angles of similar triangles are congruent.

PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

641 ANS:

20. $5x + 10 = 4x + 30$

$$x = 20$$

PTS: 2 REF: 060934ge STA: G.G.45 TOP: Similarity
KEY: basic

642 ANS: 2

Because the triangles are similar, $\frac{m\angle A}{m\angle D} = 1$

PTS: 2 REF: 011022ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

643 ANS: 4

$180 - (50 + 30) = 100$

PTS: 2 REF: 081006ge STA: G.G.45 TOP: Similarity
KEY: basic

644 ANS: 4 PTS: 2 REF: 081023ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

645 ANS: 3

$\frac{7x}{4} = \frac{7}{x}$. $7(2) = 14$

$7x^2 = 28$

$x = 2$

PTS: 2 REF: 061120ge STA: G.G.45 TOP: Similarity
KEY: basic

646 ANS:

2 $\frac{x+2}{x} = \frac{x+6}{4}$

$x^2 + 6x = 4x + 8$

$x^2 + 2x - 8 = 0$

$(x+4)(x-2) = 0$

$x = 2$

PTS: 4 REF: 081137ge STA: G.G.45 TOP: Similarity
KEY: basic

647 ANS: 3 PTS: 2 REF: 061224ge STA: G.G.45
TOP: Similarity KEY: basic

648 ANS: 4 PTS: 2 REF: 081216ge STA: G.G.45
TOP: Similarity KEY: basic

649 ANS: 2

Perimeter of $\triangle DEF$ is $5 + 8 + 11 = 24$. $\frac{5}{24} = \frac{x}{60}$

$24x = 300$

$x = 12.5$

PTS: 2 REF: 011307ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

650 ANS:

$$x^2 - 8x = 5x + 30. \quad m\angle C = 4(15) - 5 = 55$$

$$x^2 - 13x - 30 = 0$$

$$(x - 15)(x + 2) = 0$$

$$x = 15$$

PTS: 4 REF: 061337ge STA: G.G.45 TOP: Similarity
KEY: basic

651 ANS:

$$\frac{9}{36} = \frac{4}{x}$$

$$9x = 144$$

$$x = 16$$

PTS: 2 REF: 011629ge STA: G.G.45 TOP: Similarity
KEY: basic

652 ANS: 3

$$\frac{15}{18} = \frac{5}{6}$$

PTS: 2 REF: 081317ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

653 ANS:

$$\left(\frac{3}{2}\right)^2 = \frac{27}{A}$$

$$\frac{9}{4} = \frac{27}{A}$$

$$9A = 108$$

$$A = 12$$

PTS: 2 REF: 061434ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

654 ANS: 1 PTS: 2 REF: 061517ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

655 ANS: 2

$$45 \cdot \frac{8}{20} = 18$$

PTS: 2 REF: 081511ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

656 ANS:
$2\sqrt{3}$. $x^2 = 3 \cdot 4$

$x = \sqrt{12} = 2\sqrt{3}$

PTS: 2 REF: fall0829ge STA: G.G.47 TOP: Similarity
KEY: altitude

657 ANS: 1
$\overline{AB} = 10$ since $\triangle ABC$ is a 6-8-10 triangle. $6^2 = 10x$

$3.6 = x$

PTS: 2 REF: 060915ge STA: G.G.47 TOP: Similarity
KEY: leg

658 ANS: 4
Let $\overline{AD} = x$. $36x = 12^2$

$x = 4$

PTS: 2 REF: 080922ge STA: G.G.47 TOP: Similarity
KEY: leg

659 ANS:
2.4. $5a = 4^2$ $5b = 3^2$ $h^2 = ab$

$a = 3.2$ $b = 1.8$ $h^2 = 3.2 \cdot 1.8$

$h = \sqrt{5.76} = 2.4$

PTS: 4 REF: 081037ge STA: G.G.47 TOP: Similarity
KEY: leg

660 ANS: 4

$6^2 = x(x+5)$

$36 = x^2 + 5x$

$0 = x^2 + 5x - 36$

$0 = (x+9)(x-4)$

$x = 4$

PTS: 2 REF: 011123ge STA: G.G.47 TOP: Similarity
KEY: leg

661 ANS: 1

$x^2 = 7(16-7)$

$x^2 = 63$

$x = \sqrt{9}\sqrt{7}$

$x = 3\sqrt{7}$

PTS: 2 REF: 061128ge STA: G.G.47 TOP: Similarity
KEY: altitude

662 ANS:

$x(x+16) = 15^2 \quad y^2 = 16 \cdot 9$

$x^2 + 16x - 225 = 0 \quad y^2 = 144$

$(x+25)(x-9) = 0 \quad y = 12$

$x = 9$

PTS: 6 REF: 011638ge STA: G.G.47 TOP: Similarity
KEY: leg

663 ANS: 4

$x \cdot 4x = 6^2$. $PQ = 4x + x = 5x = 5(3) = 15$

$4x^2 = 36$

$x = 3$

PTS: 2 REF: 011227ge STA: G.G.47 TOP: Similarity
KEY: altitude

664 ANS: 1

$x^2 = 3 \times 12$

$x = 6$

PTS: 2 REF: 011308ge STA: G.G.47 TOP: Similarity
KEY: altitude

665 ANS: 3

$x^2 = 3 \times 12$. $\sqrt{6^2 + 3^2} = \sqrt{45} = \sqrt{9}\sqrt{5} = 3\sqrt{5}$

$x = 6$

PTS: 2 REF: 061327ge STA: G.G.47 TOP: Similarity
KEY: leg

666 ANS: 3

$x^2 = 2(2 + 10)$

$x^2 = 24$

$x = \sqrt{24} = \sqrt{4}\sqrt{6} = 2\sqrt{6}$

PTS: 2 REF: 081326ge STA: G.G.47 TOP: Similarity
KEY: leg

667 ANS:

$4x \cdot x = 6^2$

$4x^2 = 36$

$x^2 = 9$

$x = 3$

$\overline{BD} = 4(3) = 12$

PTS: 4 REF: 011437ge STA: G.G.47 TOP: Similarity
KEY: altitude

668 ANS:

$x^2 = 8(10 + 8)$

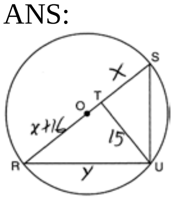
$x^2 = 144$

$x = 12$

PTS: 2 REF: 061431ge STA: G.G.47 TOP: Similarity
KEY: leg

669 ANS: 3 PTS: 2 REF: 081410ge STA: G.G.47
TOP: Similarity KEY: altitude

670 ANS:



$x(x + 16) = 15^2$ $25 \cdot 34 = y^2$

$x^2 + 16x - 225 = 0$ $5\sqrt{34} = y$

$(x + 25)(x - 9) = 0$

$x = 9$

PTS: 6 REF: 011538ge STA: G.G.47 TOP: Similarity
KEY: leg

671 ANS: 3

$x^2 = 8 \times 18$

$x^2 = 144$

$x = 12$

PTS: 2 REF: 061506ge STA: G.G.47 TOP: Similarity
KEY: altitude

672 ANS: 3

$x^2 = 4 \cdot 7$

$x = \sqrt{4} \cdot \sqrt{7}$

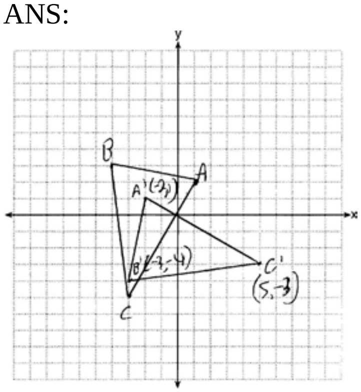
$x = 2\sqrt{7}$

PTS: 2 REF: 081528ge STA: G.G.47 TOP: Similarity
KEY: leg

673 ANS:
$R'(-3,-2)$, $S'(-4,4)$, and $T'(2,2)$.

PTS: 2 REF: 011232ge STA: G.G.54 TOP: Rotations

674 ANS:



$A'(-2,1)$, $B'(-3,-4)$, and $C'(5,-3)$

PTS: 2 REF: 081230ge STA: G.G.54 TOP: Rotations

675 ANS: 4
$(x,y) \to (-x,-y)$

PTS: 2 REF: 061304ge STA: G.G.54 TOP: Rotations

676 ANS: 4 PTS: 2 REF: 011421ge STA: G.G.54
TOP: Rotations

677 ANS:

$(x,y) \to (-y,x)$

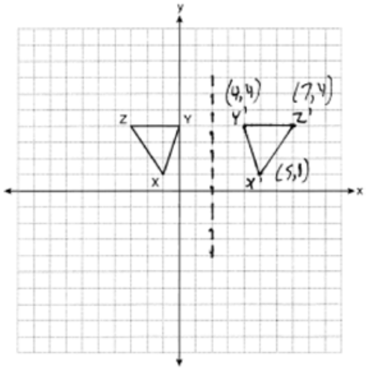
$B(5,1) \to B'(-1,5)$

$C(-3,-2) \to C'(2,-3)$

PTS: 2 REF: 061429ge STA: G.G.54 TOP: Rotations

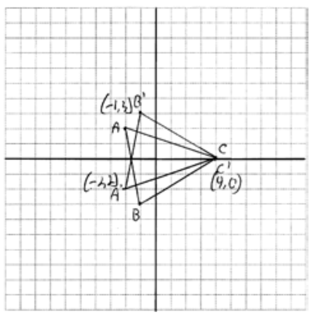
678 ANS: 3 PTS: 2 REF: 060905ge STA: G.G.54
TOP: Reflections KEY: basic

679 ANS:



PTS: 2 REF: 061032ge STA: G.G.54 TOP: Reflections
KEY: grids

680 ANS:

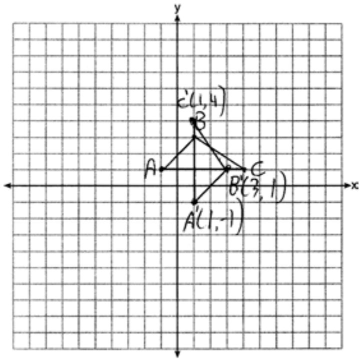


PTS: 2 REF: 011130ge STA: G.G.54 TOP: Reflections
KEY: grids

681 ANS: 2 PTS: 2 REF: 081108ge STA: G.G.54
TOP: Reflections KEY: basic

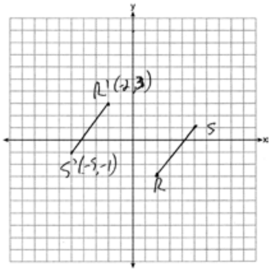
682 ANS: 1 PTS: 2 REF: 081113ge STA: G.G.54
TOP: Reflections KEY: basic

683 ANS:



PTS: 2 REF: 061530ge STA: G.G.54 TOP: Reflections
KEY: grids

684 ANS:



PTS: 2 REF: 081529ge STA: G.G.54 TOP: Reflections
KEY: grids

685 ANS: 1
$(x,y) \rightarrow (x+3, y+1)$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

686 ANS: 3
$-5+3=-2 \qquad 2+-4=-2$

PTS: 2 REF: 011107ge STA: G.G.54 TOP: Translations

687 ANS: 2 PTS: 2 REF: 011617ge STA: G.G.54
TOP: Translations

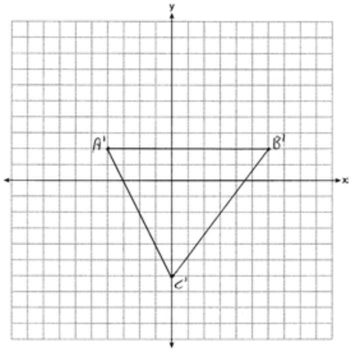
688 ANS:
$T_{-2,1} \;\; A(0,1)$

PTS: 2 REF: 081431ge STA: G.G.54 TOP: Translations

689 ANS:
$A'(2,2), B'(3,0), C(1,-1)$

PTS: 2 REF: 081329ge STA: G.G.58 TOP: Dilations

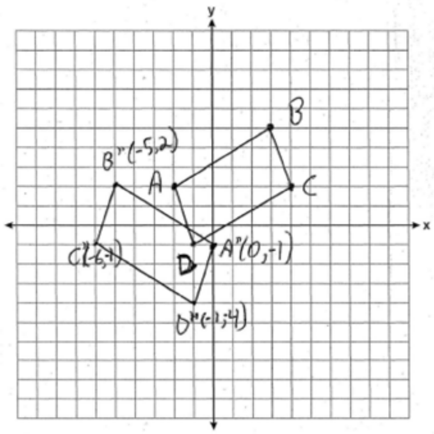
690 ANS:



PTS: 2 REF: 081429ge STA: G.G.58 TOP: Dilations

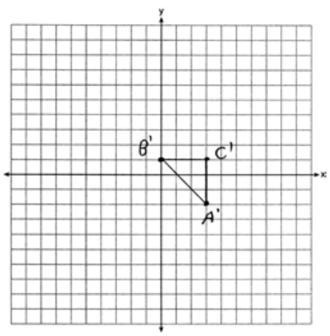
691 ANS: 3 PTS: 2 REF: 011524ge STA: G.G.58
TOP: Dilations

692 ANS:



PTS: 2 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

693 ANS:



PTS: 2 REF: 011630ge STA: G.G.58 TOP: Dilations

694 ANS: 1
$A'(2,4)$

PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

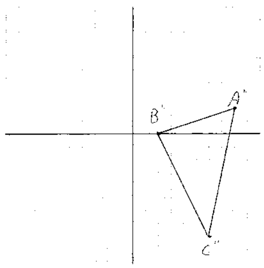
695 ANS: 3
$(3,-2) \rightarrow (2,3) \rightarrow (8,12)$

PTS: 2 REF: 011126ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

696 ANS: 1
After the translation, the coordinates are $A'(-1,5)$ and $B'(3,4)$. After the dilation, the coordinates are $A''(-2,10)$ and $B''(6,8)$.

PTS: 2 REF: fall0823ge STA: G.G.58 TOP: Compositions of Transformations

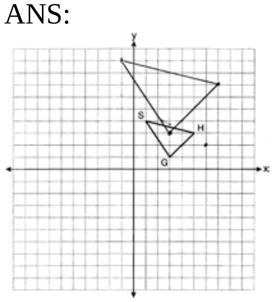
697 ANS:



$A''(8,2)$, $B''(2,0)$, $C''(6,-8)$

PTS: 4 REF: 081036ge STA: G.G.58 TOP: Compositions of Transformations

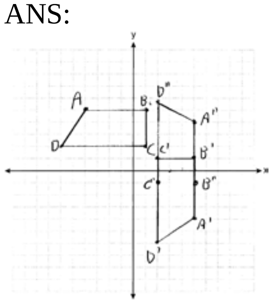
698 ANS:



$G''(3,3), H''(7,7), S''(-1,9)$

PTS: 4 REF: 081136ge STA: G.G.58 TOP: Compositions of Transformations

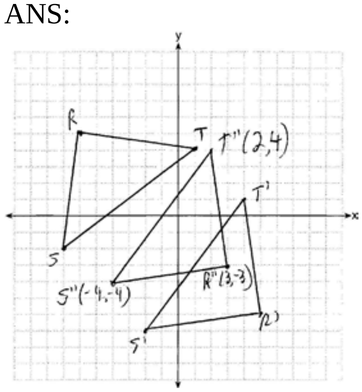
699 ANS:



$A'(5,-4)$, $B'(5,1)$, $C'(2,1)$, $D'(2,-6)$; $A''(5,4)$, $B''(5,-1)$, $C''(2,-1)$, $D''(2,6)$

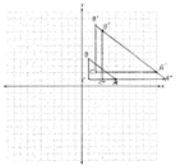
PTS: 4 REF: 061236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

700 ANS:



PTS: 4 REF: 081236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

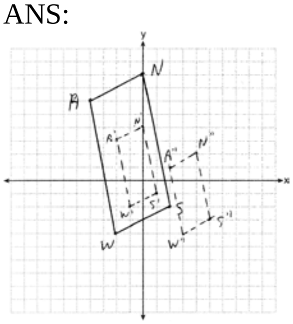
701 ANS:



$A''(11,1)$, $B''(3,7)$, $C''(3,1)$

PTS: 4 REF: 011336ge STA: G.G.58 TOP: Compositions of Transformations

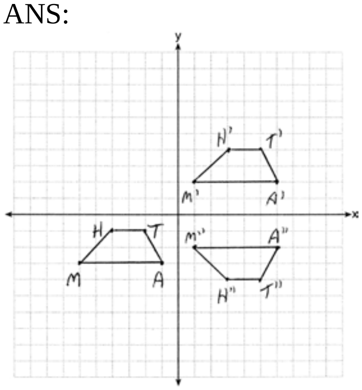
702 ANS:



$S''(5,-3)$, $W''(3,-4)$, $A''(2,1)$, and $N''(4,2)$

PTS: 4 REF: 061335ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

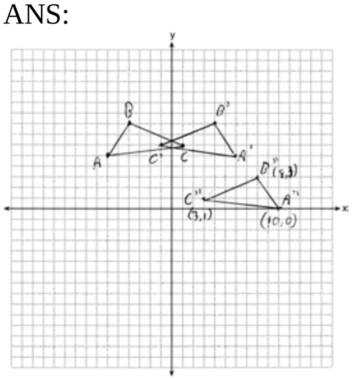
703 ANS:



$M''(1,-2), A''(6,-2), T''(5,-4), H''(3,-4)$

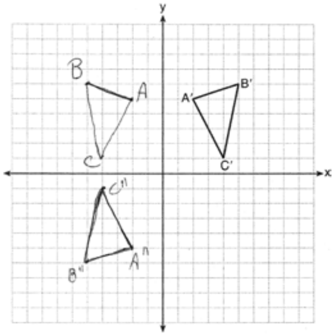
PTS: 4 REF: 081336ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

704 ANS:



PTS: 3 REF: 011436ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

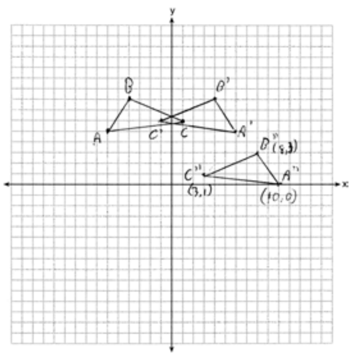
705 ANS:



$r_{x\text{-axis}}$

PTS: 4 REF: 061435ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

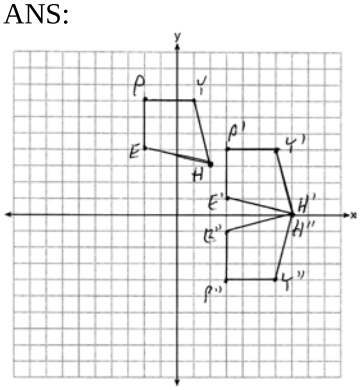
706 ANS:



R_{180°

PTS: 4 REF: 011635ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

707 ANS:

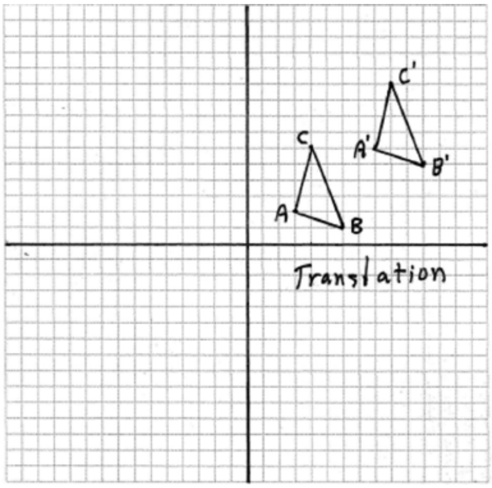


$H'(7,0), Y'(6,4), P'(3,4), E'(3,1)$

$H''(7,0), Y''(6,-4), P''(3,-4), E''(3,-1)$

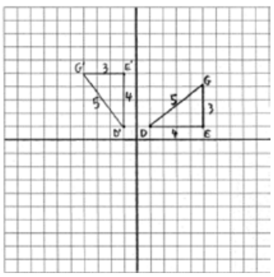
PTS: 4 REF: 011535ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

708 ANS:



PTS: 2 REF: fall0830ge STA: G.G.55 TOP: Properties of Transformations

709 ANS:



$D'(-1,1)$, $E'(-1,5)$, $G'(-4,5)$

PTS: 4 REF: 080937ge STA: G.G.55 TOP: Properties of Transformations

710 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

711 ANS: 1 PTS: 2 REF: 061005ge STA: G.G.55
TOP: Properties of Transformations

712 ANS: 1 PTS: 2 REF: 011102ge STA: G.G.55
TOP: Properties of Transformations

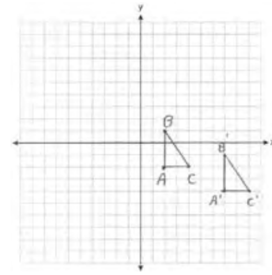
713 ANS:
Yes. A reflection is an isometry.

PTS: 2 REF: 061132ge STA: G.G.55 TOP: Properties of Transformations

714 ANS: 3 PTS: 2 REF: 081104ge STA: G.G.55
TOP: Properties of Transformations

715 ANS: 2 PTS: 2 REF: 011211ge STA: G.G.55
TOP: Properties of Transformations

716 ANS:



$A'(7,-4), B'(7,-1). C'(9,-4)$. The areas are equal because translations preserve distance.

PTS: 4 REF: 011235ge STA: G.G.55 TOP: Properties of Transformations

717 ANS: 2 PTS: 2 REF: 081202ge STA: G.G.55
TOP: Properties of Transformations

718 ANS: 1
$C(6,6)$ remains fixed after the reflection.

PTS: 2 REF: 011622ge STA: G.G.55 TOP: Properties of Transformations

719 ANS:
Distance is preserved after the reflection. $2x+13=9x-8$

$$21=7x$$

$$3=x$$

PTS: 2 REF: 011329ge STA: G.G.55 TOP: Properties of Transformations

720 ANS: 1 PTS: 2 REF: 061307ge STA: G.G.55
TOP: Properties of Transformations

721 ANS: 4
Distance is preserved after a rotation.

PTS: 2 REF: 081304ge STA: G.G.55 TOP: Properties of Transformations

722 ANS: 3 PTS: 2 REF: 061421ge STA: G.G.55
TOP: Properties of Transformations

723 ANS: 4 PTS: 2 REF: 081408ge STA: G.G.55
TOP: Properties of Transformations

724 ANS: 3 PTS: 2 REF: 011503ge STA: G.G.55
TOP: Properties of Transformations

725 ANS: 2 PTS: 2 REF: 061509ge STA: G.G.55
TOP: Properties of Transformations

726 ANS: 2 PTS: 2 REF: 081515ge STA: G.G.55
TOP: Properties of Transformations

727 ANS: 3 PTS: 2 REF: 081021ge STA: G.G.57
TOP: Properties of Transformations

728 ANS:
36, because a dilation does not affect angle measure. 10, because a dilation does affect distance.

PTS: 4 REF: 011035ge STA: G.G.59 TOP: Properties of Transformations

729 ANS: 2 PTS: 2 REF: 061126ge STA: G.G.59
TOP: Properties of Transformations

730 ANS: 2 PTS: 2 REF: 061201ge STA: G.G.59
TOP: Properties of Transformations
731 ANS: 3 PTS: 2 REF: 081204ge STA: G.G.59
TOP: Properties of Transformations
732 ANS: 1 PTS: 2 REF: 011405ge STA: G.G.59
TOP: Properties of Transformations
733 ANS: 4 PTS: 2 REF: 081506ge STA: G.G.59
TOP: Properties of Transformations
734 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations
735 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations
736 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Identifying Transformations
737 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations
738 ANS: 4 PTS: 2 REF: 061018ge STA: G.G.56
TOP: Identifying Transformations
739 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.56
TOP: Identifying Transformations
740 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
TOP: Identifying Transformations
741 ANS: 2 PTS: 2 REF: 061227ge STA: G.G.56
TOP: Identifying Transformations
742 ANS: 3 PTS: 2 REF: 011427ge STA: G.G.56
TOP: Identifying Transformations
743 ANS: 3 PTS: 2 REF: 081405ge STA: G.G.56
TOP: Identifying Transformations
744 ANS: 4
(2) rotation is also a correct response

PTS: 2 REF: 011527ge STA: G.G.56 TOP: Identifying Transformations
745 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations
746 ANS: 2
A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

747 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations

748 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations

749 ANS: 1
Translations and reflections do not affect distance.

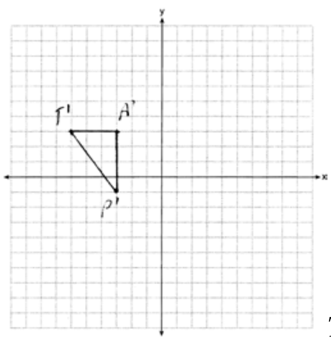
PTS: 2 REF: 080908ge STA: G.G.61
TOP: Analytical Representations of Transformations

750 ANS: 3 PTS: 2 REF: 061501ge STA: G.G.61
TOP: Analytical Representations of Transformations

751 ANS: 1
$(2,-7) \rightarrow (2-3,-7+5) = (-1,-2)$

PTS: 2 REF: 061504ge STA: G.G.61
TOP: Analytical Representations of Transformations

752 ANS:



$T'(-6,3), A'(-3,3), P'(-3,-1)$

PTS: 2 REF: 061229ge STA: G.G.61
TOP: Analytical Representations of Transformations

753 ANS: 3 PTS: 2 REF: 011304ge STA: G.G.61
TOP: Analytical Representations of Transformations

754 ANS: 2 PTS: 2 REF: 081504ge STA: G.G.61
TOP: Analytical Representations of Transformations

755 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

756 ANS: 4
Median $\overline{BF}$ bisects $\overline{AC}$ so that $\overline{CF} \cong \overline{FA}$.

PTS: 2 REF: fall0810ge STA: G.G.24 TOP: Statements

757 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations

758 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations

759 ANS:
The medians of a triangle are not concurrent. False.

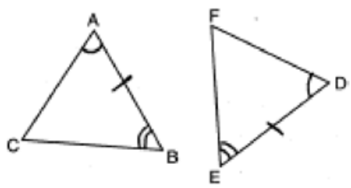
PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations
760 ANS: 1 PTS: 2 REF: 011213ge STA: G.G.24
TOP: Negations
761 ANS: 2 PTS: 2 REF: 061202ge STA: G.G.24
TOP: Negations
762 ANS:
2 is not a prime number, false.

PTS: 2 REF: 081229ge STA: G.G.24 TOP: Negations
763 ANS: 1 PTS: 2 REF: 011303ge STA: G.G.24
TOP: Statements
764 ANS: 2 PTS: 2 REF: 081301ge STA: G.G.24
TOP: Statements
765 ANS: 1 PTS: 2 REF: 081303ge STA: G.G.24
TOP: Negations
766 ANS: 4 PTS: 2 REF: 061412ge STA: G.G.24
TOP: Negations
767 ANS: 4 PTS: 2 REF: 081417ge STA: G.G.24
TOP: Statements
768 ANS: 3 PTS: 2 REF: 011506ge STA: G.G.24
TOP: Negations
769 ANS:
True. The first statement is true and the second statement is false. In a disjunction, if either statement is true, the disjunction is true.

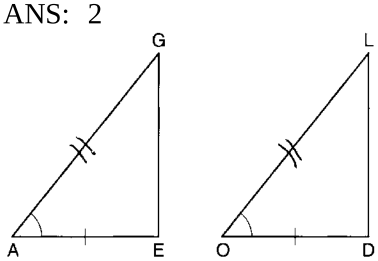
PTS: 2 REF: 060933ge STA: G.G.25 TOP: Compound Statements
KEY: disjunction
770 ANS: 4 PTS: 2 REF: 011118ge STA: G.G.25
TOP: Compound Statements KEY: general
771 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction
772 ANS: 4 PTS: 2 REF: 061423ge STA: G.G.25
TOP: Compound Statements KEY: conditional
773 ANS: 1 PTS: 2 REF: 081421ge STA: G.G.25
TOP: Compound Statements KEY: general
774 ANS: 4 PTS: 2 REF: 081505ge STA: G.G.25
TOP: Compound Statements KEY: disjunction
775 ANS:
Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

PTS: 2 REF: fall0834ge STA: G.G.26 TOP: Conditional Statements
776 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements

777 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements
778 ANS: 1 PTS: 2 REF: 011605ge STA: G.G.26
TOP: Converse and Biconditional
779 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse and Biconditional
780 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26
TOP: Contrapositive
781 ANS: 1 PTS: 2 REF: 011320ge STA: G.G.26
TOP: Conditional Statements
782 ANS: 1 PTS: 2 REF: 061314ge STA: G.G.26
TOP: Converse and Biconditional
783 ANS: 4 PTS: 2 REF: 081318ge STA: G.G.26
TOP: Converse and Biconditional
784 ANS: 2 PTS: 2 REF: 011517ge STA: G.G.26
TOP: Contrapositive
785 ANS: 3 PTS: 2 REF: 061526ge STA: G.G.26
TOP: Inverse
786 ANS: 1 PTS: 2 REF: 081513ge STA: G.G.26
TOP: Contrapositive
787 ANS: 3

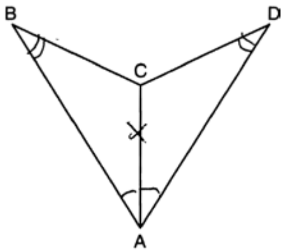


PTS: 2 REF: 060902ge STA: G.G.28 TOP: Triangle Congruency
788 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency
789 ANS: 3 PTS: 2 REF: 011627ge STA: G.G.28
TOP: Triangle Congruency
790 ANS: 2



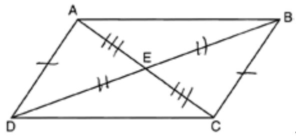
PTS: 2 REF: 081007ge STA: G.G.28 TOP: Triangle Congruency
791 ANS: 1 PTS: 2 REF: 011122ge STA: G.G.28
TOP: Triangle Congruency

792 ANS: 4



PTS: 2 REF: 081114ge STA: G.G.28 TOP: Triangle Congruency

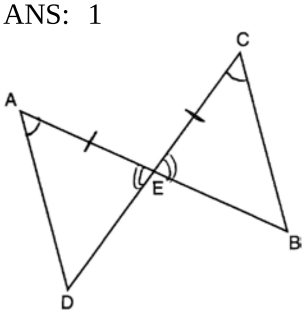
793 ANS: 3



. Opposite sides of a parallelogram are congruent and the diagonals of a parallelogram bisect each other.

PTS: 2 REF: 061222ge STA: G.G.28 TOP: Triangle Congruency

794 ANS: 1

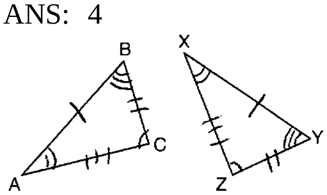


PTS: 2 REF: 081210ge STA: G.G.28 TOP: Triangle Congruency

795 ANS: 1 PTS: 2 REF: 011412ge STA: G.G.28
TOP: Triangle Congruency

796 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29
TOP: Triangle Congruency

797 ANS: 4



PTS: 2 REF: 081001ge STA: G.G.29 TOP: Triangle Congruency

798 ANS: 2 PTS: 2 REF: 011624ge STA: G.G.29
TOP: Triangle Congruency

799 ANS: 3 PTS: 2 REF: 061102ge STA: G.G.29
TOP: Triangle Congruency

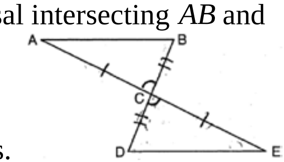
800 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency

801 ANS: 4 PTS: 2 REF: 011216ge STA: G.G.29
TOP: Triangle Congruency
802 ANS: 1 PTS: 2 REF: 011301ge STA: G.G.29
TOP: Triangle Congruency
803 ANS: 2
(1) is true because of vertical angles. (3) and (4) are true because CPCTC.

PTS: 2 REF: 061302ge STA: G.G.29 TOP: Triangle Congruency
804 ANS: 3 PTS: 2 REF: 081309ge STA: G.G.29
TOP: Triangle Congruency
805 ANS: 4 PTS: 2 REF: 061410ge STA: G.G.29
TOP: Triangle Congruency
806 ANS: 4 PTS: 2 REF: 081501ge STA: G.G.29
TOP: Triangle Congruency
807 ANS: 2

$$AC = BD$$
$$AC - BC = BD - BC$$
$$AB \cong CD$$

PTS: 2 REF: 061206ge STA: G.G.27 TOP: Line Proofs
808 ANS: 2 PTS: 2 REF: 061427ge STA: G.G.27
TOP: Line Proofs
809 ANS: 4 PTS: 2 REF: 011108ge STA: G.G.27
TOP: Angle Proofs
810 ANS:
$\overline{AC} \cong \overline{EC}$ and $\overline{DC} \cong \overline{BC}$ because of the definition of midpoint. $\angle ACB \cong \angle ECD$ because of vertical angles. $\triangle ABC \cong \triangle EDC$ because of SAS. $\angle CDE \cong \angle CBA$ because of CPCTC. $\overline{BD}$ is a transversal intersecting $\overline{AB}$ and $\overline{ED}$. Therefore $\overline{AB} \parallel \overline{DE}$ because $\angle CDE$ and $\angle CBA$ are congruent alternate interior angles.



PTS: 6 REF: 060938ge STA: G.G.27 TOP: Triangle Proofs
811 ANS:
$\angle B$ and $\angle C$ are right angles because perpendicular lines form right angles. $\angle B \cong \angle C$ because all right angles are congruent. $\angle AEB \cong \angle DEC$ because vertical angles are congruent. $\triangle ABE \cong \triangle DCE$ because of ASA. $\overline{AB} \cong \overline{DC}$ because CPCTC.

PTS: 4 REF: 061235ge STA: G.G.27 TOP: Triangle Proofs
812 ANS: 1

$$AB = CD$$
$$AB + BC = CD + BC$$
$$AC = BD$$

PTS: 2 REF: 081207ge STA: G.G.27 TOP: Triangle Proofs

813 ANS:
$\triangle MAH$, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are given. $\overline{MA} \cong \overline{AM}$ (reflexive property). $\triangle MAH$ is an isosceles triangle (definition of isosceles triangle). $\angle AMB \cong \angle MAT$ (isosceles triangle theorem). B is the midpoint of $\overline{MH}$ and T is the midpoint of $\overline{AH}$ (definition of median). $\text{m}\overline{MB} = \frac{1}{2}\text{m}\overline{MH}$ and $\text{m}\overline{AT} = \frac{1}{2}\text{m}\overline{AH}$ (definition of midpoint). $\overline{MB} \cong \overline{AT}$ (multiplication postulate). $\triangle MBA \cong \triangle ATM$ (SAS). $\angle MBA \cong \angle ATM$ (CPCTC).

PTS: 6 REF: 061338ge STA: G.G.27 TOP: Triangle Proofs

814 ANS:
$\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$ (Given). $\angle CBD \cong \angle ABD$ (Definition of angle bisector). $\overline{BD} \cong \overline{BD}$ (Reflexive property). $\angle CDB$ and $\angle ADB$ are right angles (Definition of perpendicular). $\angle CDB \cong \angle ADB$ (All right angles are congruent). $\triangle CDB \cong \triangle ADB$ (SAS). $\overline{AB} \cong \overline{CB}$ (CPCTC).

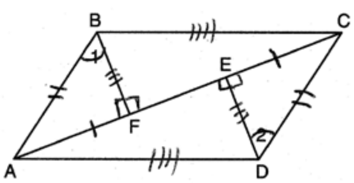
PTS: 4 REF: 081335ge STA: G.G.27 TOP: Triangle Proofs

815 ANS:
$\overline{MT}$ and $\overline{HA}$ intersect at B, $\overline{MA} \parallel \overline{HT}$, and $\overline{MT}$ bisects $\overline{HA}$ (Given). $\angle MBA \cong \angle TBH$ (Vertical Angles). $\angle A \cong \angle H$ (Alternate Interior Angles). $\overline{BH} \cong \overline{BA}$ (The bisection of a line segment creates two congruent segments). $\triangle MAB \cong \triangle THB$ (ASA). $\overline{MA} \cong \overline{HT}$ (CPCTC).

PTS: 4 REF: 081435ge STA: G.G.27 TOP: Triangle Proofs

816 ANS:
$\overline{BE}$ and $\overline{AD}$ intersect at point C, $\overline{BC} \cong \overline{EC}$, $\overline{AC} \cong \overline{DC}$, $\overline{AB}$ and $\overline{DE}$ are drawn (Given). $\angle BCA \cong \angle ECD$ (Vertical Angles). $\triangle ABC \cong \triangle DEC$ (SAS).

PTS: 2 REF: 011529ge STA: G.G.27 TOP: Triangle Proofs

817 ANS:


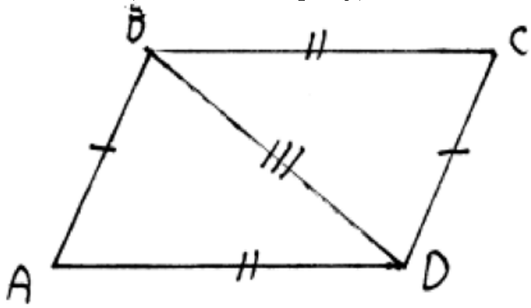
$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Line Segment Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); $ABCD$ is a parallelogram (opposite sides of quadrilateral $ABCD$ are congruent)

PTS: 6 REF: 080938ge STA: G.G.27 TOP: Quadrilateral Proofs

818 ANS:
$\overline{JK} \cong \overline{LM}$ because opposite sides of a parallelogram are congruent. $\overline{LM} \cong \overline{LN}$ because of the Isosceles Triangle Theorem. $\overline{LM} \cong \overline{JM}$ because of the transitive property. $JKLM$ is a rhombus because all sides are congruent.

PTS: 4 REF: 011036ge STA: G.G.27 TOP: Quadrilateral Proofs

819 ANS:
$\overline{BD} \cong \overline{DB}$ (Reflexive Property); $\triangle ABD \cong \triangle CDB$ (SSS); $\angle BDC \cong \angle ABD$ (CPCTC).



PTS: 4 REF: 061035ge STA: G.G.27 TOP: Quadrilateral Proofs

820 ANS:
Quadrilateral $ABCD$, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$ are given. $\overline{AD} \parallel \overline{BC}$ because if two lines are cut by a transversal so that a pair of alternate interior angles are congruent, the lines are parallel. $ABCD$ is a parallelogram because if one pair of opposite sides of a quadrilateral are both congruent and parallel, the quadrilateral is a parallelogram. $\overline{AE} \cong \overline{CE}$ because the diagonals of a parallelogram bisect each other. $\angle FEA \cong \angle GEC$ as vertical angles. $\triangle AEF \cong \triangle CEG$ by ASA.

PTS: 6 REF: 011238ge STA: G.G.27 TOP: Quadrilateral Proofs

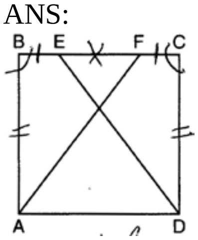
821 ANS: 3 PTS: 2 REF: 081208ge STA: G.G.27
TOP: Quadrilateral Proofs

822 ANS:
Rectangle $ABCD$ with points E and F on side $\overline{AB}$, segments CE and DF intersect at G, and $\angle ADG \cong \angle BCE$ are given. $\overline{AD} \cong \overline{BC}$ because opposite sides of a rectangle are congruent. $\angle A$ and $\angle B$ are right angles and congruent because all angles of a rectangle are right and congruent. $\triangle ADF \cong \triangle BCE$ by ASA. $\overline{AF} \cong \overline{BE}$ per CPCTC. $\overline{EF} \cong \overline{FE}$ under the Reflexive Property. $\overline{AF} - \overline{EF} \cong \overline{BE} - \overline{FE}$ using the Subtraction Property of Segments. $\overline{AE} \cong \overline{BF}$ because of the Definition of Segments.

PTS: 6 REF: 011338ge STA: G.G.27 TOP: Quadrilateral Proofs

823 ANS: 2 PTS: 2 REF: 011411ge STA: G.G.27
TOP: Quadrilateral Proofs

824 ANS:

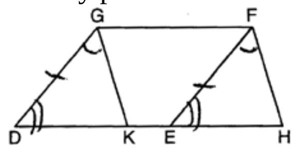


Square $ABCD$; E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$; $\overline{AF}$ and $\overline{DE}$ drawn (Given). $\overline{AB} \cong \overline{CD}$ (All sides of a square are congruent). $\angle ABF \cong \angle DCE$ (All angles of a square are equiangular). $\overline{EF} \cong \overline{FE}$ (Reflexive property). $\overline{BE} + \overline{EF} \cong \overline{FC} + \overline{FE}$ (Additive property of line segments). $\overline{BF} \cong \overline{CE}$ (Angle addition). $\triangle ABF \cong \triangle DCE$ (SAS). $\overline{AF} \cong \overline{DE}$ (CPCTC).

PTS: 6 REF: 061538ge STA: G.G.27 TOP: Quadrilateral Proofs

825 ANS:

Parallelogram $DEFG$, K and H are points on $\overrightarrow{DE}$ such that $\angle DGK \cong \angle EFH$ and $\overline{GK}$ and $\overline{FH}$ are drawn (given). $\overline{DG} \cong \overline{EF}$ (opposite sides of a parallelogram are congruent). $\overline{DG} \parallel \overline{EF}$ (opposite sides of a parallelogram are parallel). $\angle D \cong \angle FEH$ (corresponding angles formed by parallel lines and a transversal are congruent).

$\triangle DGK \cong \triangle EFH$ (ASA). $\overline{DK} \cong \overline{EH}$ (CPCTC). 

PTS: 6 REF: 081538ge STA: G.G.27 TOP: Quadrilateral Proofs

826 ANS:

Because $\overline{AB} \parallel \overline{DC}$, $\overset{\frown}{AD} \cong \overset{\frown}{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\angle DAC \cong \angle DBC$ because inscribed angles that intercept the same arc are congruent. Therefore, $\triangle ACD \cong \triangle BDC$ because of AAS.

PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

827 ANS:

$\overline{OA} \cong \overline{OB}$ because all radii are equal. $\overline{OP} \cong \overline{OP}$ because of the reflexive property. $\overline{OA} \perp \overline{PA}$ and $\overline{OB} \perp \overline{PB}$ because tangents to a circle are perpendicular to a radius at a point on a circle. $\angle PAO$ and $\angle PBO$ are right angles because of the definition of perpendicular. $\angle PAO \cong \angle PBO$ because all right angles are congruent. $\triangle AOP \cong \triangle BOP$ because of HL. $\angle AOP \cong \angle BOP$ because of CPCTC.

PTS: 6 REF: 061138ge STA: G.G.27 TOP: Circle Proofs

828 ANS:

2. The diameter of a circle is $\perp$ to a tangent at the point of tangency. 4. An angle inscribed in a semicircle is a right angle. 5. All right angles are congruent. 7. AA. 8. Corresponding sides of congruent triangles are in proportion. 9. The product of the means equals the product of the extremes.

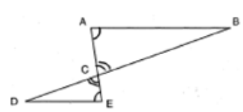
PTS: 6 REF: 011438ge STA: G.G.27 TOP: Circle Proofs

829 ANS: 1

$\triangle PRT$ and $\triangle SRQ$ share $\angle R$ and it is given that $\angle RPT \cong \angle RSQ$.

PTS: 2 REF: fall0821ge STA: G.G.44 TOP: Similarity Proofs

830 ANS: 2

$\angle ACB$ and $\angle ECD$ are congruent vertical angles and $\angle CAB \cong \angle CED$. 

PTS: 2 REF: 060917ge STA: G.G.44 TOP: Similarity Proofs

831 ANS: 4 PTS: 2 REF: 011019ge STA: G.G.44
TOP: Similarity Proofs

832 ANS:
$\angle B$ and $\angle E$ are right angles because of the definition of perpendicular lines. $\angle B \cong \angle E$ because all right angles are congruent. $\angle BFD$ and $\angle DFE$ are supplementary and $\angle ECA$ and $\angle ACB$ are supplementary because of the definition of supplementary angles. $\angle DFE \cong \angle ACB$ because angles supplementary to congruent angles are congruent. $\triangle ABC \sim \triangle DEF$ because of AA.

PTS: 4 REF: 011136ge STA: G.G.44 TOP: Similarity Proofs

833 ANS:
$\angle ACB \cong \angle AED$ is given. $\angle A \cong \angle A$ because of the reflexive property. Therefore $\triangle ABC \sim \triangle ADE$ because of AA.

PTS: 2 REF: 081133ge STA: G.G.44 TOP: Similarity Proofs

834 ANS: 3 PTS: 2 REF: 011209ge STA: G.G.44
TOP: Similarity Proofs

835 ANS: 2 PTS: 2 REF: 061324ge STA: G.G.44
TOP: Similarity Proofs

836 ANS: 4 PTS: 2 REF: 011528ge STA: G.G.44
TOP: Similarity Proofs