JEFFERSON MATH PROJECT REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Geometry Regents Exam Questions from Fall 2008 to August 2012 Sorted by PI: Topic

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Dear Sir

I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

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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 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 $\frac{5}{3}$

7 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 $\frac{1}{2}$

8 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 $\frac{1}{10}$

9 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 $3x + y = 0$

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

G.G.63: PARALLEL AND PERPENDICULAR LINES

11 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

12 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 $3y = -2x + 12$

13 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 $y - 2x = 3$

14 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 $2y + 10x = 8$

15 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

16 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

17 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°.

18 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

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

20 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.

G.G.64: PARALLEL AND PERPENDICULAR LINES

21 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 $y = -2x - 9$

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

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

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

25 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 $y = -2x - 5$

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

G.G.65: PARALLEL AND PERPENDICULAR LINES

27 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 $y = -\frac{1}{2}x - \frac{25}{2}$

28 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 $y = -2x + 17$

29 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 $y = \frac{3}{2}x + 6$

30 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 $3x + 4y = 14$

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

32 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 $y = 2x - 1$

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

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

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

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

G.G.68: PERPENDICULAR BISECTOR

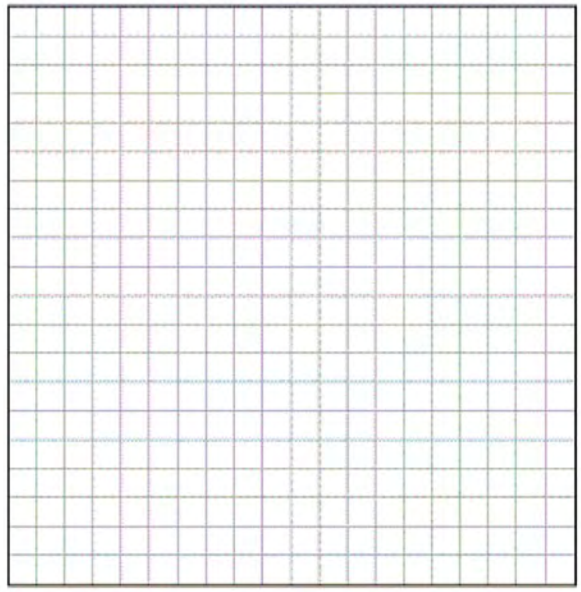
37 The coordinates of the endpoints of $\overline{AB}$ are $A(0,0)$ and $B(0,6)$. The equation of the perpendicular bisector of $\overline{AB}$ is

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

38 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 $y = 2x - 12$

39 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]



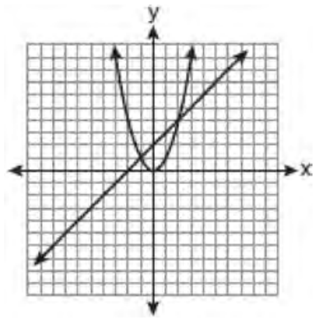
SYSTEMS

G.G.70: QUADRATIC-LINEAR SYSTEMS

40 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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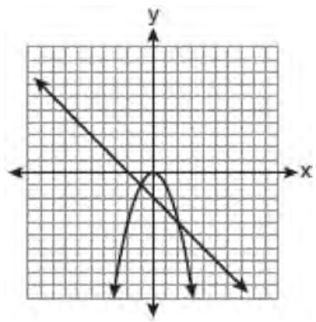

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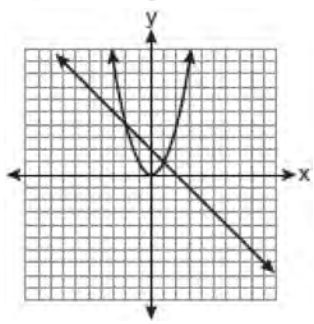

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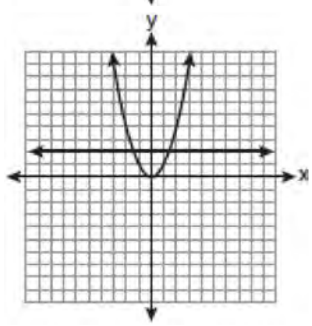


41 Given the system of equations: $y = x^2 - 4x$

$$x = 4$$

The number of points of intersection is

1 1
2 2
3 3
4 0

42 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 $(3,1)$

43 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

44 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 $(5,0)$

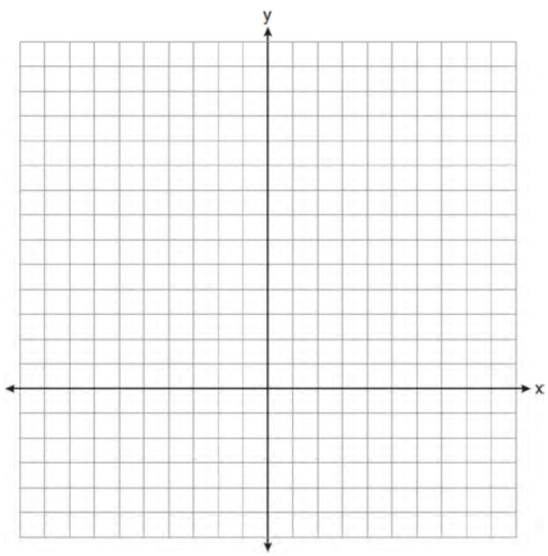
45 When solved graphically, what is the solution to the following system of equations?

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

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

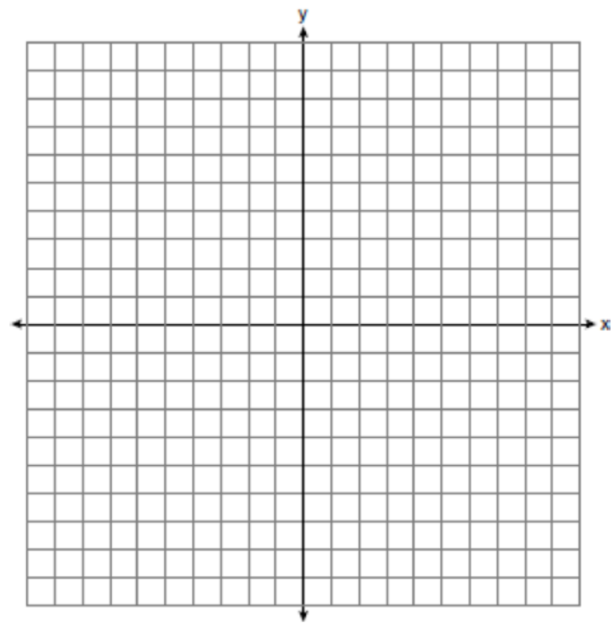
46 On the set of axes below, solve the following system of equations graphically for all values of x and y.

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



47 Solve the following system of equations graphically.

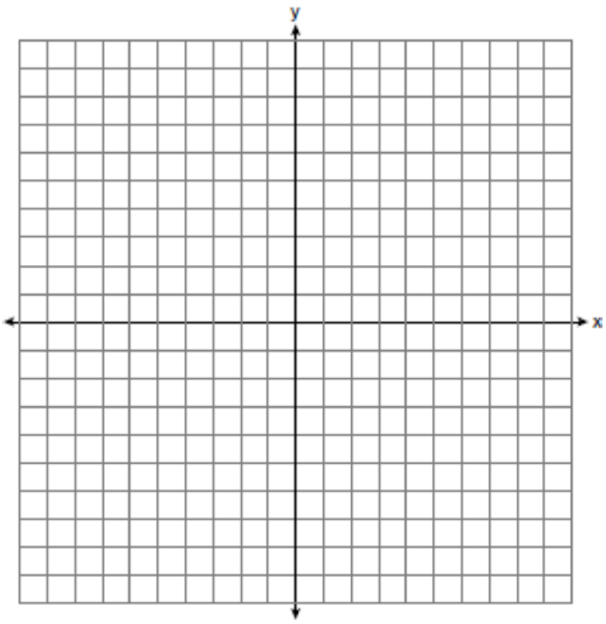
$$2x^2 - 4x = y + 1$$
$$x + y = 1$$



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

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

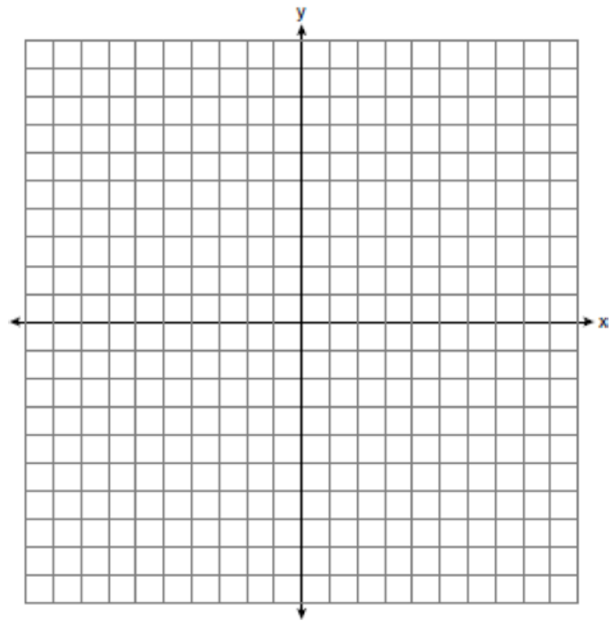
$$2y + 16 = 4x$$



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

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

$$2y + 4 = -x$$

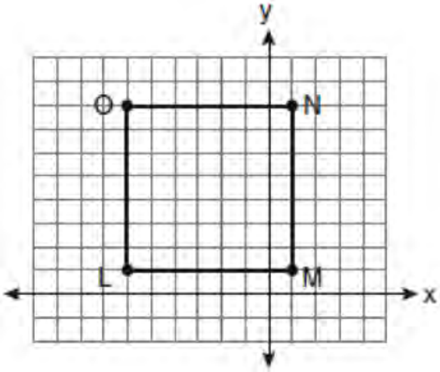


TOOLS OF GEOMETRY

G.G.66: MIDPOINT

50 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 $\left(3,4\frac{1}{2}\right)$

51 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 $\left(-3\frac{1}{2},3\frac{1}{2}\right)$

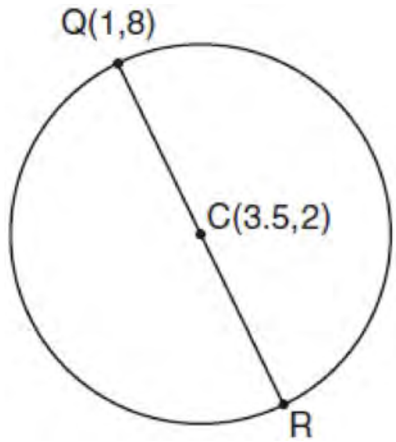
3 $\left(-2\frac{1}{2},3\frac{1}{2}\right)$

4 $\left(-2\frac{1}{2},4\frac{1}{2}\right)$

52 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 $(4,3)$

53 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.



54 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 $(4x+4,2y)$

55 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 $(5,-2)$

56 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 $(-5,2)$

57 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 $(-7,-2)$

58 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.

G.G.67: DISTANCE

59 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

60 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 $2\sqrt{5}$

61 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

62 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 $\sqrt{145}$

63 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 $2\sqrt{41}$

64 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 $\sqrt{233}$

65 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 $2\sqrt{26}$

66 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

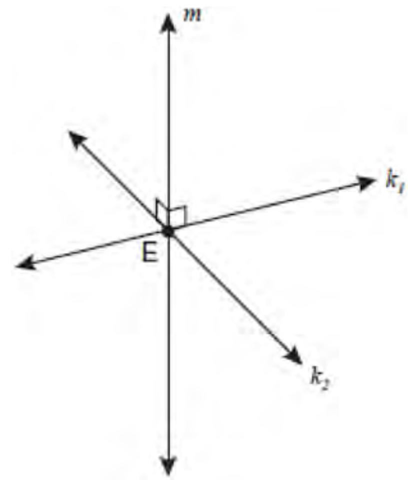
67 What is the length of $\overline{AB}$ with endpoints $A(-1,0)$ and $B(4,-3)$?
1 $\sqrt{6}$
2 $\sqrt{18}$
3 $\sqrt{34}$
4 $\sqrt{50}$

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

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

G.G.1: PLANES

70 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.

71 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.

72 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 $\mathcal{P}$

73 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*.

74 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.

G.G.2: PLANES

75 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

76 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

G.G.3: PLANES

77 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

78 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

79 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

G.G.4: PLANES

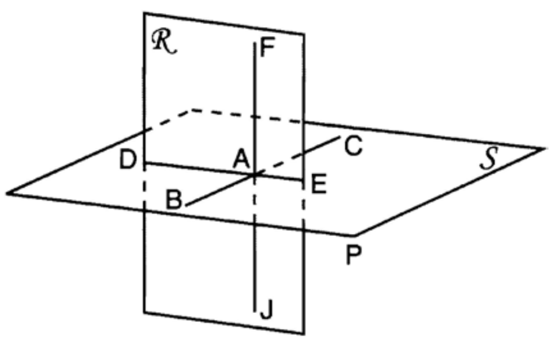
80 If two different lines are perpendicular to the same plane, they are
1 collinear
2 coplanar
3 congruent
4 consecutive

G.G.5: PLANES

81 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 $\mathcal{R}$.

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

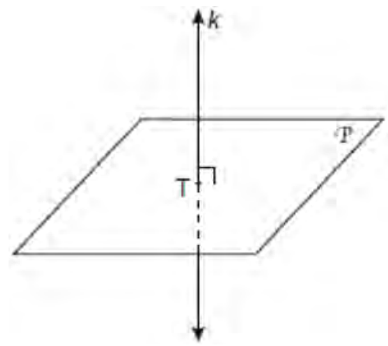


Which fact is *not* sufficient to show that planes R and S are perpendicular?

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

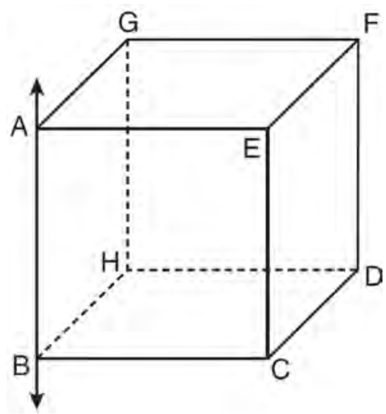
83 In the diagram below, line k is perpendicular to plane $\mathcal{P}$ at point T.



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 $\mathcal{P}$.

84 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

85 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

86 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

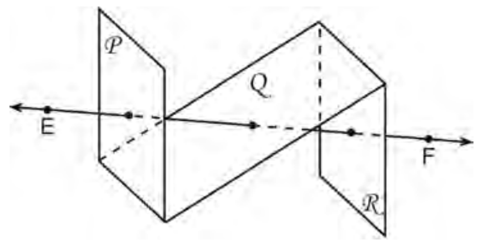
87 Line *k* is drawn so that it is perpendicular to two distinct planes, *P* and *R*. What must be true about planes *P* and *R*?
1 Planes *P* and *R* are skew.
2 Planes *P* and *R* are parallel.
3 Planes *P* and *R* are perpendicular.
4 Plane *P* intersects plane *R* but is not perpendicular to plane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

88 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

89 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 $\mathcal{D}$.

90 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*.

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

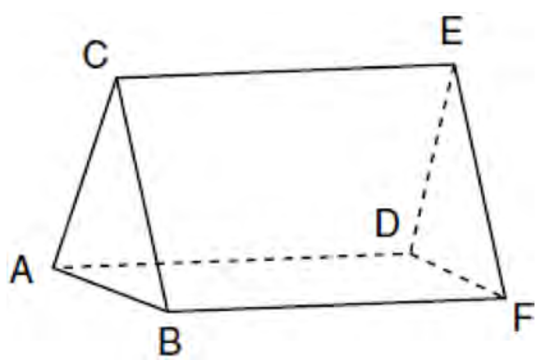


If $\overleftrightarrow{EF}$ is perpendicular to planes $\mathcal{P}$ and $\mathcal{R}$, which statement must be true?

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 $\mathcal{P}$.

G.G.10: SOLIDS

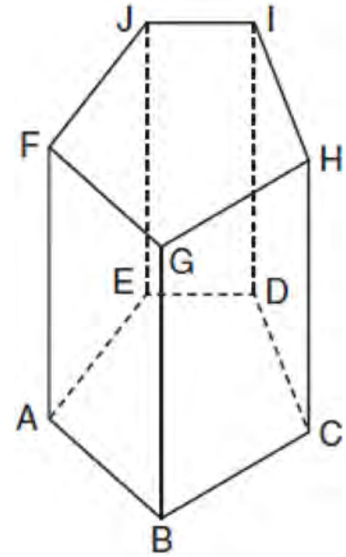
92 The figure in the diagram below is a triangular prism.



Which statement must be true?

1 $\overline{DE} \cong \overline{AB}$
2 $\overline{AD} \cong \overline{BC}$
3 $\overline{AD} \parallel \overline{CE}$
4 $\overline{DE} \parallel \overline{BC}$

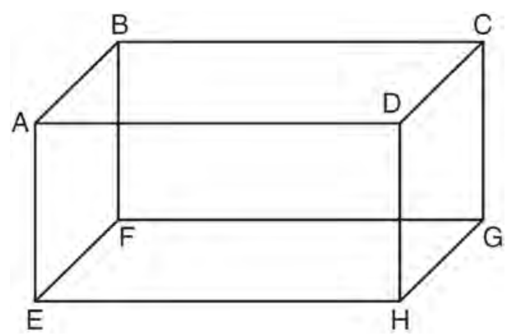
93 The diagram below shows a right pentagonal prism.



Which statement is always true?

1 $\overline{BC} \parallel \overline{ED}$
2 $\overline{FG} \parallel \overline{CD}$
3 $\overline{FJ} \parallel \overline{IH}$
4 $\overline{GB} \parallel \overline{HC}$

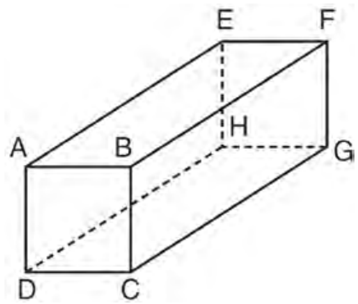
94 The diagram below shows a rectangular prism.



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 $\overline{EF}$

95 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

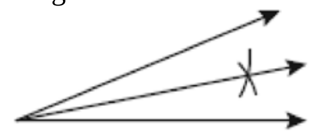
G.G.13: SOLIDS

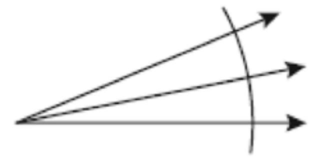
96 The lateral faces of a regular pyramid are composed of

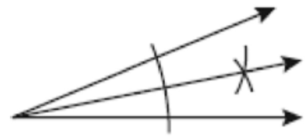
1 squares
2 rectangles
3 congruent right triangles
4 congruent isosceles triangles

G.G.17: CONSTRUCTIONS

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

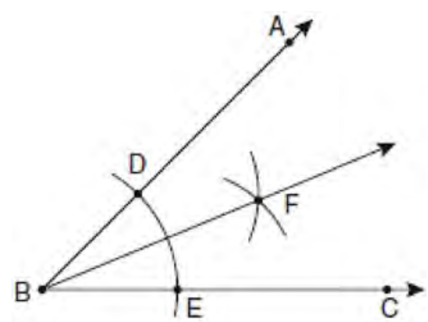
1 

2 

3 

4 

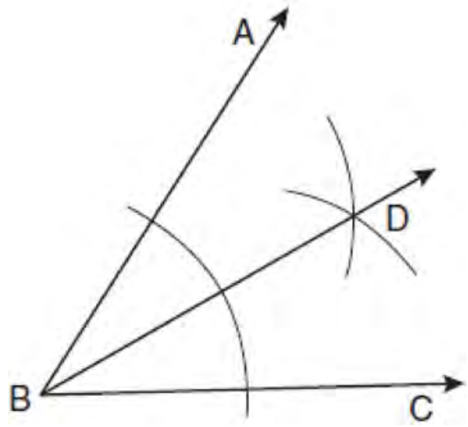
98 The diagram below shows the construction of the bisector of $\angle ABC$.



Which statement is *not* true?

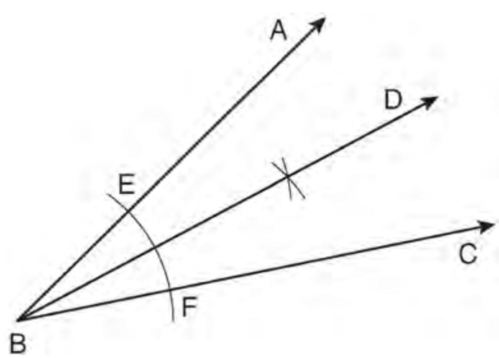
1 $m\angle EBF = \frac{1}{2} m\angle ABC$
2 $m\angle DBF = \frac{1}{2} m\angle ABC$
3 $m\angle EBF = m\angle ABC$
4 $m\angle DBF = m\angle EBF$

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



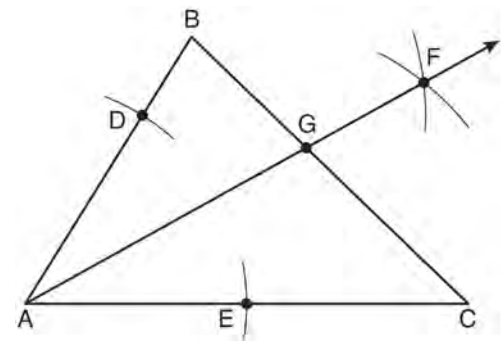
1 $m\angle ABD = \frac{1}{2} m\angle CBD$
2 $m\angle ABD = m\angle CBD$
3 $m\angle ABD = m\angle ABC$
4 $m\angle CBD = \frac{1}{2} m\angle ABD$

100 .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*.



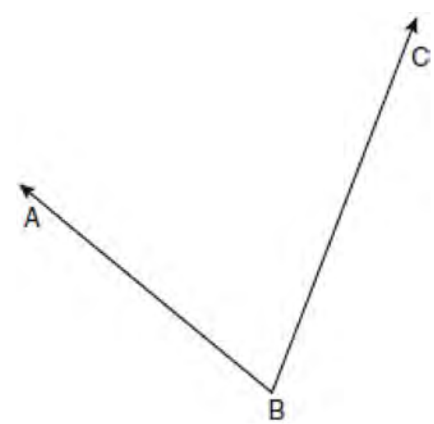
Which statement is *false*?
1 $m\angle ABD = m\angle DBC$
2 $\frac{1}{2}(m\angle ABC) = m\angle ABD$
3 $2(m\angle DBC) = m\angle ABC$
4 $2(m\angle ABC) = m\angle CBD$

101 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.

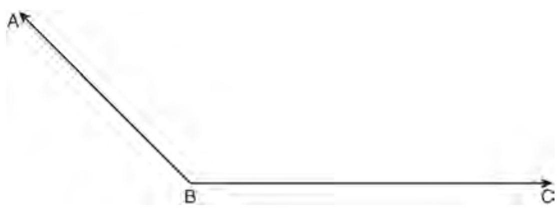


Which statement must be true?
1 $\overrightarrow{AF}$ bisects side $\overline{BC}$
2 $\overrightarrow{AF}$ bisects $\angle BAC$
3 $\overrightarrow{AF} \perp \overline{BC}$
4 $\triangle ABG \sim \triangle ACG$

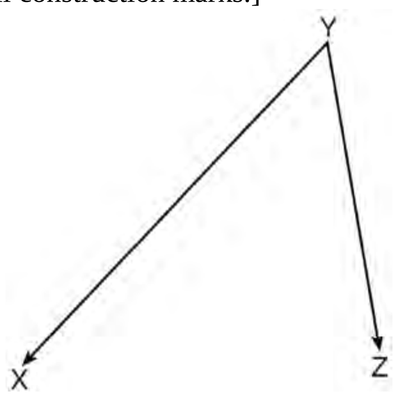
102 Using a compass and straightedge, construct the angle bisector of $\angle ABC$ shown below. [Leave all construction marks.]



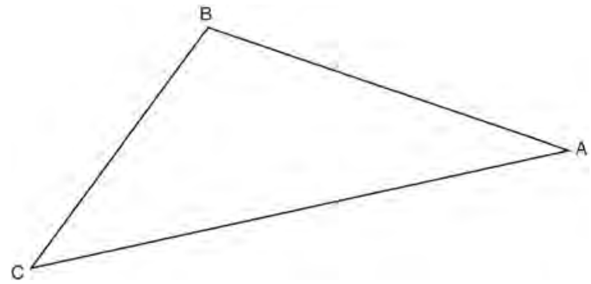
103 On the diagram below, use a compass and straightedge to construct the bisector of $\angle ABC$. [Leave all construction marks.]



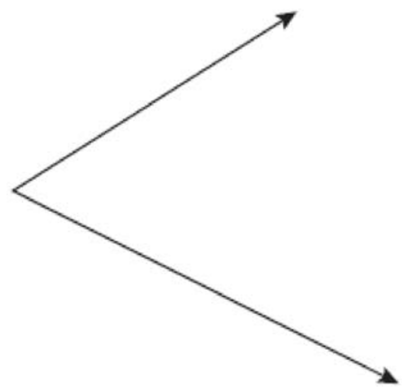
104 On the diagram below, use a compass and straightedge to construct the bisector of $\angle XYZ$. [Leave all construction marks.]



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

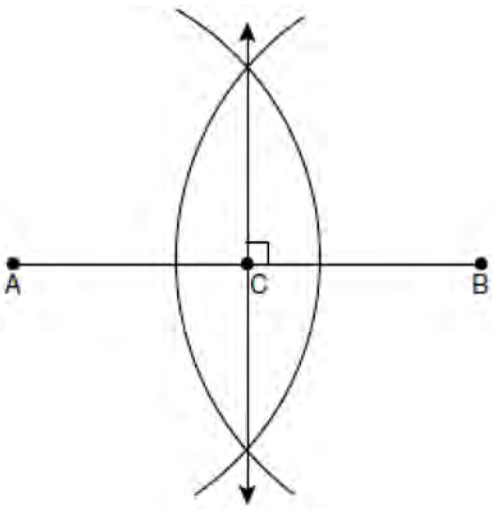


106 Using a compass and straightedge, construct the bisector of the angle shown below. [*Leave all construction marks*.]



G.G.18: CONSTRUCTIONS

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



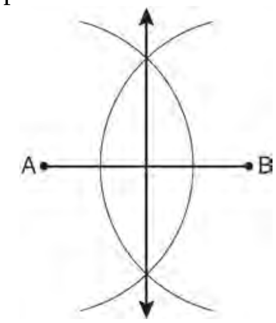
Which statement is *not* true?

1 $AC = CB$
2 $CB = \frac{1}{2}AB$
3 $AC = 2AB$
4 $AC + CB = AB$

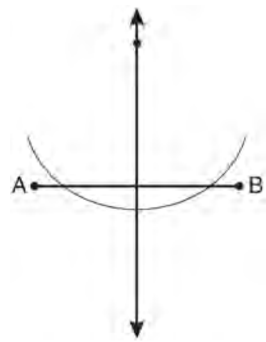
108 One step in a construction uses the endpoints of $\overline{AB}$ to create arcs with the same radii. The arcs intersect above and below the segment. What is the relationship of $\overline{AB}$ and the line connecting the points of intersection of these arcs?

1 collinear
2 congruent
3 parallel
4 perpendicular

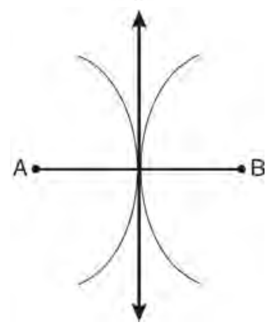
109 Which diagram shows the construction of the perpendicular bisector of $\overline{AB}$?



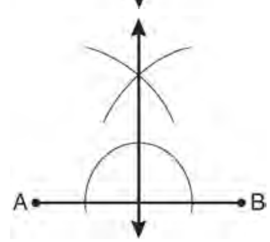
1



2

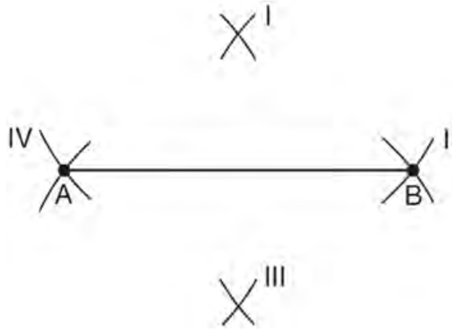


3



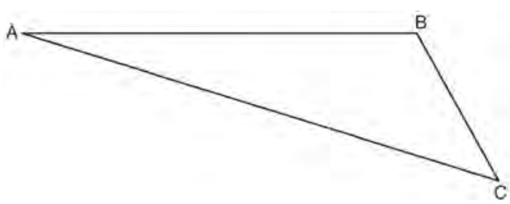
4

110 Line segment *AB* is shown in the diagram below.



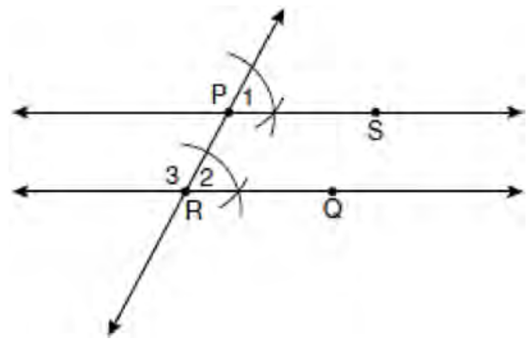
Which two sets of construction marks, labeled I, II, III, and IV, are part of the construction of the perpendicular bisector of line segment *AB*?
1 I and II
2 I and III
3 II and III
4 II and IV

111 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.]



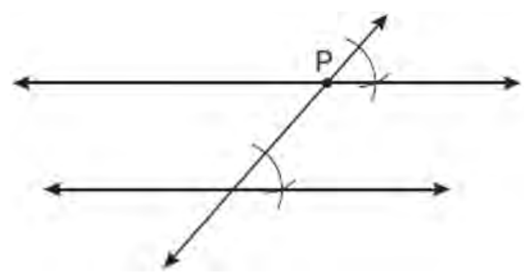
G.G.19: CONSTRUCTIONS

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



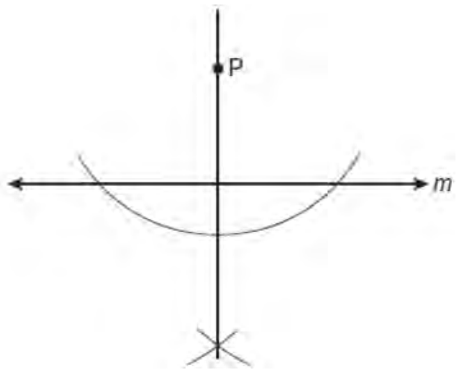
Which statement justifies this construction?
1 $m\angle 1 = m\angle 2$
2 $m\angle 1 = m\angle 3$
3 $\overline{PR} \cong \overline{RQ}$
4 $\overline{PS} \cong \overline{RQ}$

113 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.

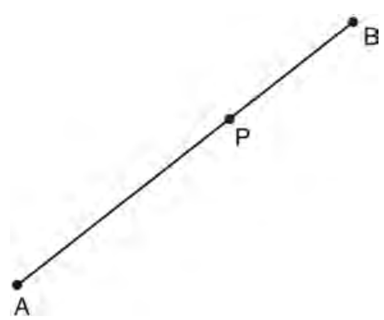
114 The diagram below shows the construction of a line through point P perpendicular to line m.



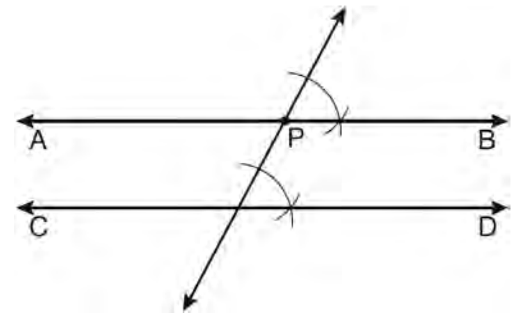
Which statement is demonstrated by this construction?

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.

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



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



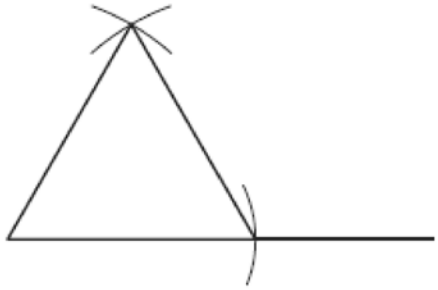
Which theorem justifies this method of construction?

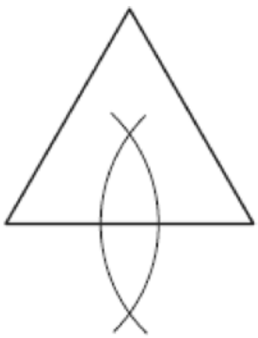
1 If two lines in a plane are perpendicular to a transversal at different points, then the lines are parallel.
2 If two lines in a plane are cut by a transversal to form congruent corresponding angles, then the lines are parallel.
3 If two lines in a plane are cut by a transversal to form congruent alternate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

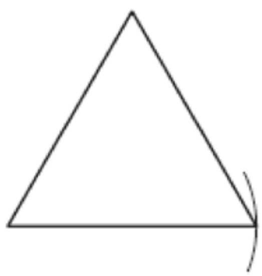
117 Using a compass and straightedge, construct a line that passes through point P and is perpendicular to line m. [Leave all construction marks.]

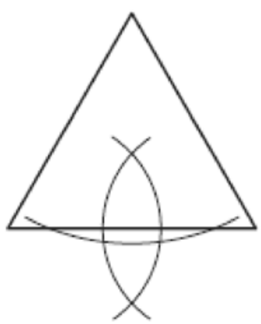
G.G.20: CONSTRUCTIONS

118 Which diagram shows the construction of an equilateral triangle?

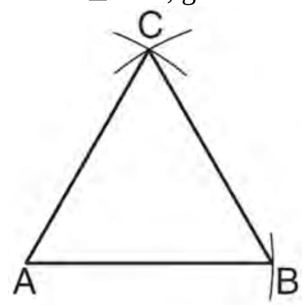

1


2

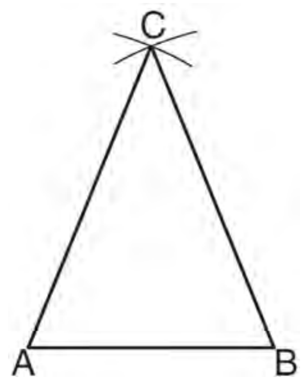

3


4

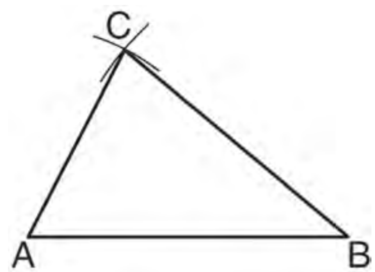
119 Which diagram represents a correct construction of equilateral ΔABC, given side $\overline{AB}$?



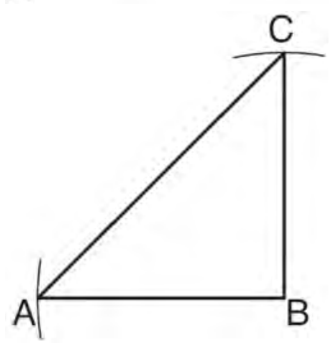
1



2



3



4

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

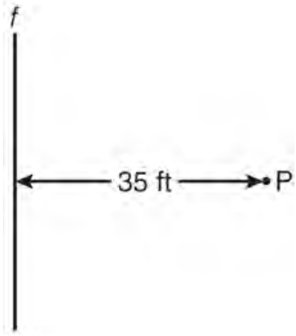
121 Using a compass and straightedge, and $\overline{AB}$ below, construct an equilateral triangle with all sides congruent to $\overline{AB}$. [Leave all construction marks.]

122 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.]

G.G.22: LOCUS

123 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

124 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.

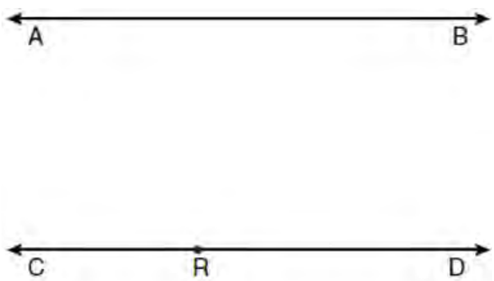


How many locations are possible for the bird bath?
1 1
2 2
3 3
4 0

125 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.

126 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.

127 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.



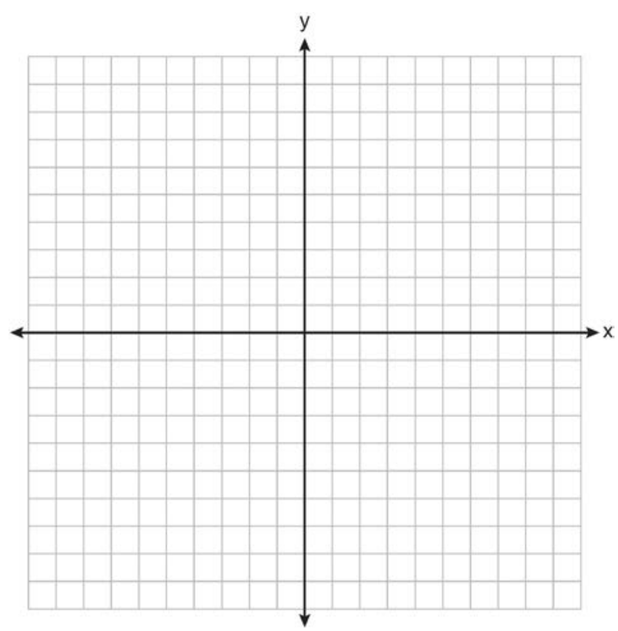
128 In the diagram below, car *A* is parked 7 miles from car *B*. Sketch the points that are 4 miles from car *A* and sketch the points that are 4 miles from car *B*. Label with an **X** all points that satisfy both conditions.

G.G.23: LOCUS

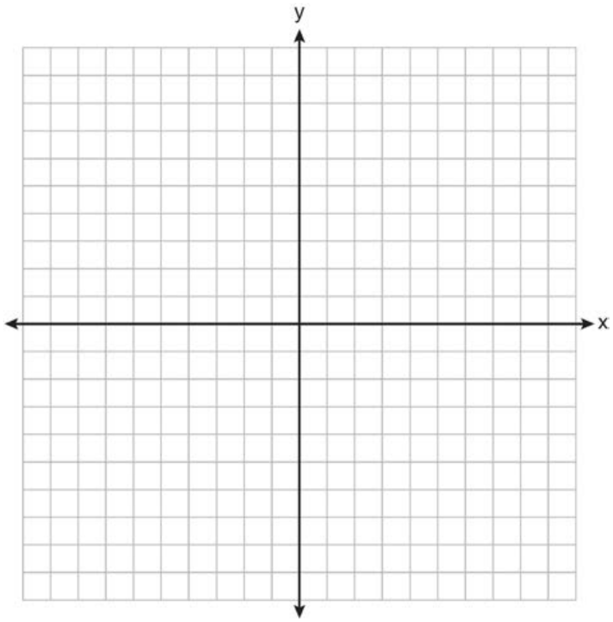
129 In a coordinate plane, how many points are both 5 units from the origin and 2 units from the *x*-axis?
1 1
2 2
3 3
4 4

130 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

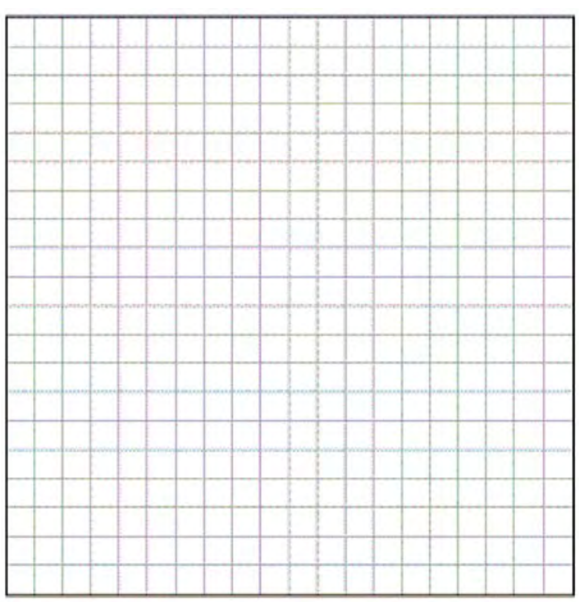
131 A city is planning to build a new park. The park must be equidistant from school *A* at $(3,3)$ and school *B* at $(3,-5)$. The park also must be exactly 5 miles from the center of town, which is located at the origin on the coordinate graph. Each unit on the graph represents 1 mile. On the set of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



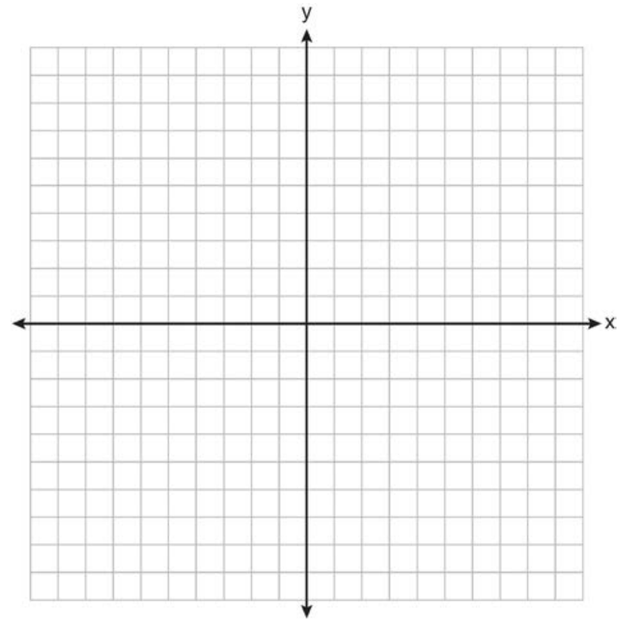
132 On the set of axes below, sketch the points that are 5 units from the origin and sketch the points that are 2 units from the line $y = 3$. Label with an **X** all points that satisfy both conditions.



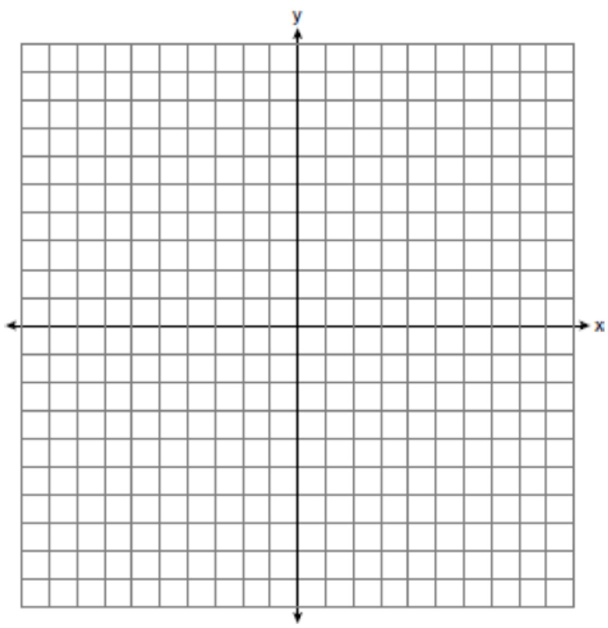
133 On the grid below, graph the points that are equidistant from both the x and y axes and the points that are 5 units from the origin. Label with an **X** all points that satisfy *both* conditions.



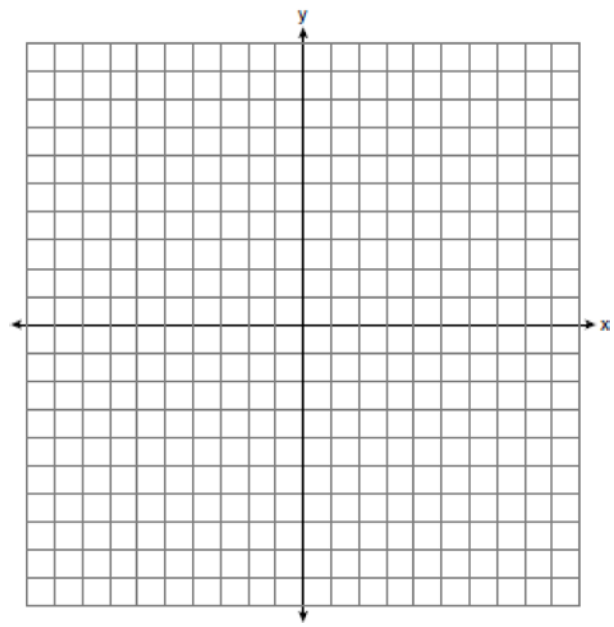
134 On the set of axes below, graph the locus of points that are four units from the point $(2, 1)$. On the same set of axes, graph the locus of points that are two units from the line $x = 4$. State the coordinates of all points that satisfy both conditions.



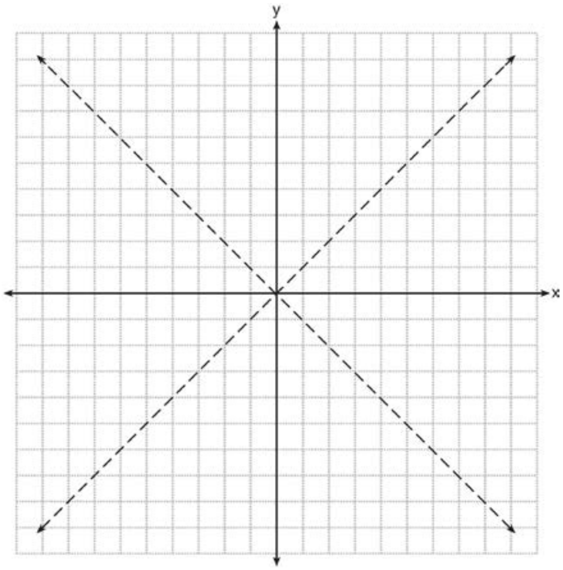
135 On the set of coordinate axes below, graph the locus of points that are equidistant from the lines $y = 6$ and $y = 2$ and also graph the locus of points that are 3 units from the y-axis. State the coordinates of *all* points that satisfy *both* conditions.



136 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.



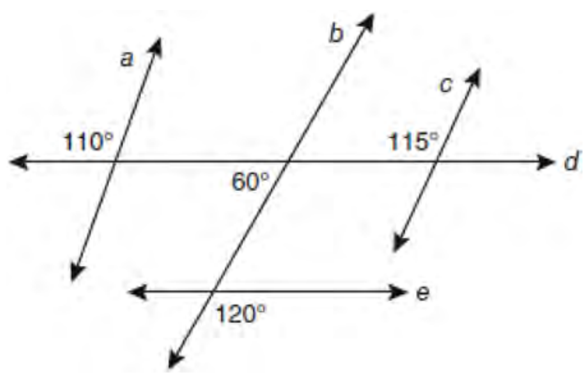
137 The graph below shows the locus of points equidistant from the *x*-axis and *y*-axis. On the same set of axes, graph the locus of points 3 units from the line $x = 0$. Label with an **X** *all* points that satisfy both conditions.



ANGLES

G.G.35: PARALLEL LINES & TRANSVERSALS

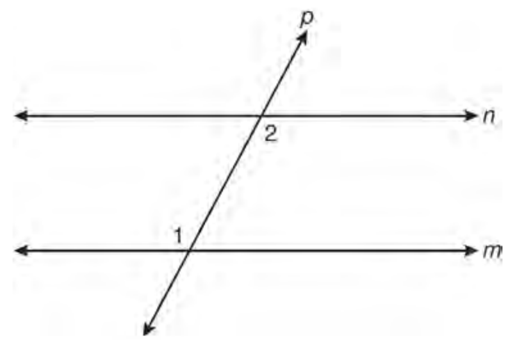
138 Based on the diagram below, which statement is true?



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

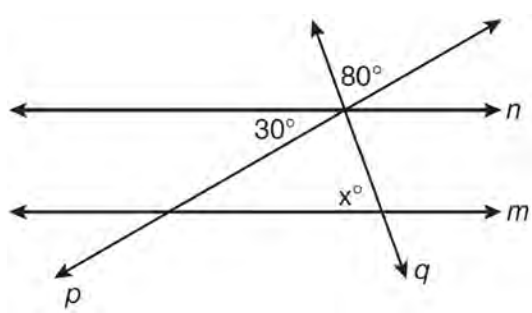
139 A transversal intersects two lines. Which condition would always make the two lines parallel?
1 Vertical angles are congruent.
2 Alternate interior angles are congruent.
3 Corresponding angles are supplementary.
4 Same-side interior angles are complementary.

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



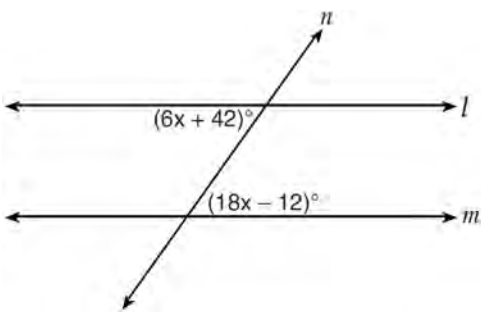
If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines *m* and *n* are parallel when *x* equals
1 12.5
2 15
3 87.5
4 105

141 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

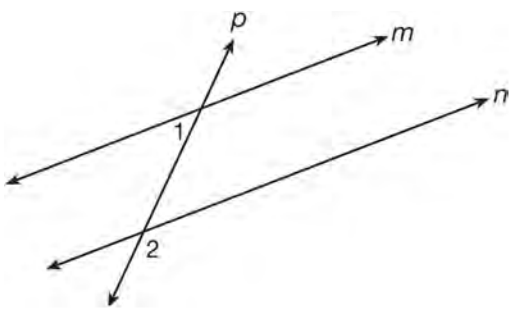
142 Line n intersects lines l and m, forming the angles shown in the diagram below.



Which value of x would prove $l \parallel m$?

1 2.5
2 4.5
3 6.25
4 8.75

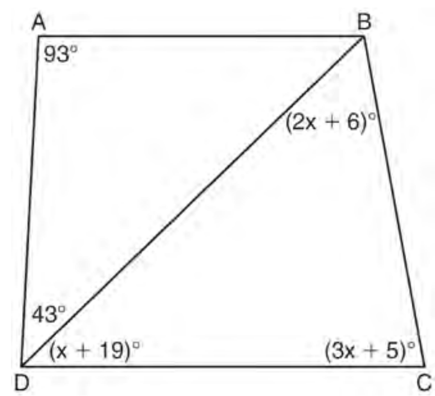
143 As shown in the diagram below, lines m and n are cut by transversal p.



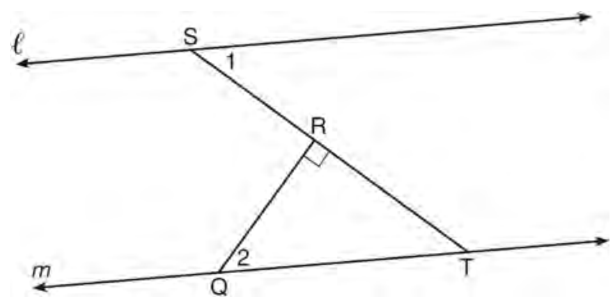
If $m\angle 1 = 4x + 14$ and $m\angle 2 = 8x + 10$, lines m and n are parallel when x equals

1 1
2 6
3 13
4 17

144 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.



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

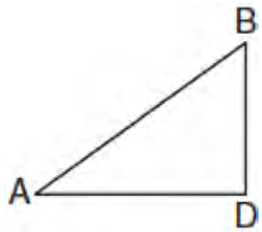


If $m\angle 1 = 63$, find $m\angle 2$.

TRIANGLES

G.G.48: PYTHAGOREAN THEOREM

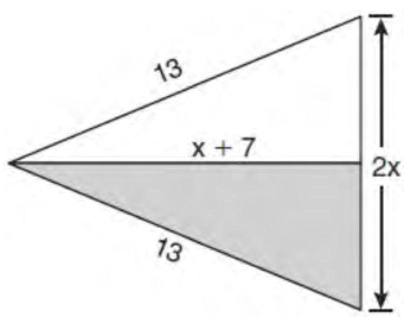
146 In the diagram below of $\triangle ADB$, $m\angle BDA = 90$, $AD = 5\sqrt{2}$, and $AB = 2\sqrt{15}$.



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

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

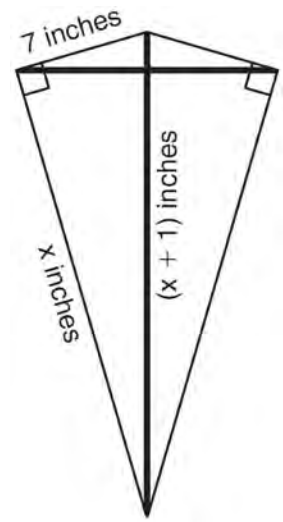
147 The diagram below shows a pennant in the shape of an isosceles triangle. The equal sides each measure 13, the altitude is $x + 7$, and the base is $2x$.



What is the length of the base?

1 5
2 10
3 12
4 24

148 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

149 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 $\{15, 36, 39\}$

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

150 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°

151 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°

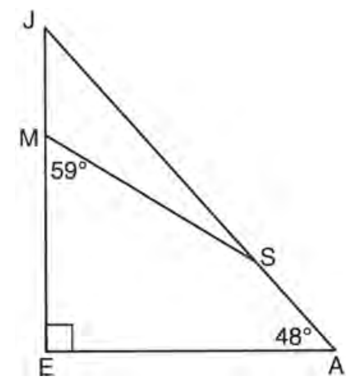
152 In $\triangle ABC$, $m\angle A = x$, $m\angle B = 2x + 2$, and $m\angle C = 3x + 4$. What is the value of x?
1 29
2 31
3 59
4 61

153 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 $m\angle D = m\angle F$

154 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

155 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

156 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 $m\angle EMS = 59$.



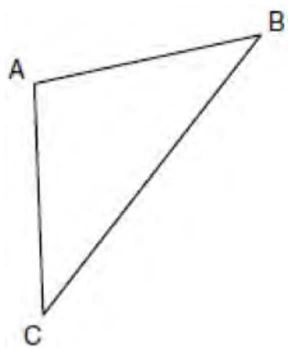
What is $m\angle JSM$?
1 163
2 121
3 42
4 17

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

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

G.G.31: ISOSCELES TRIANGLE THEOREM

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



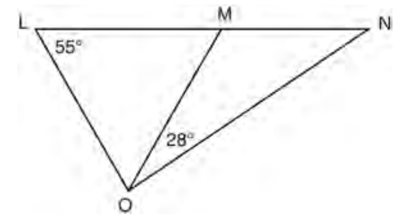
What is the measure of $\angle A$?
1 40°
2 50°
3 70°
4 100°

160 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 $\overline{AD} \cong \overline{DC}$

161 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 $m\angle C < m\angle B$

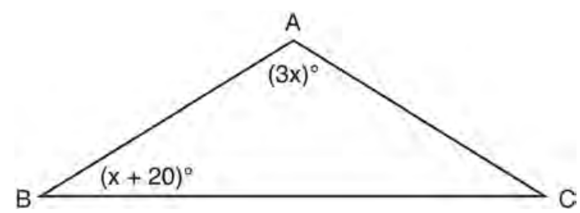
162 If the vertex angles of two isosceles triangles are congruent, then the triangles must be
1 acute
2 congruent
3 right
4 similar

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



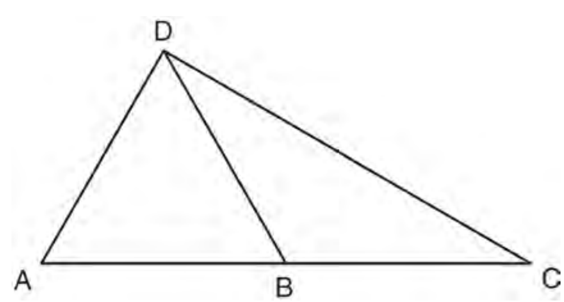
If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?
1 27
2 28
3 42
4 70

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



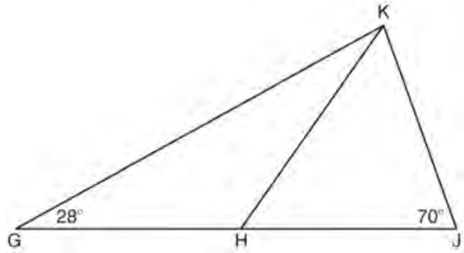
What is the value of x?
1 10
2 28
3 32
4 40

165 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 $m\angle C$.



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

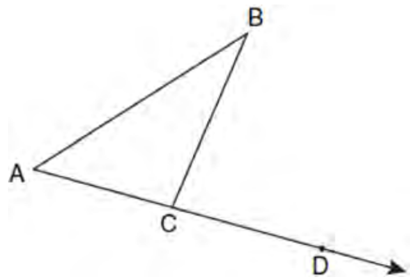
167 In the diagram below of $\triangle GJK$, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, $m\angle G = 28$, and $m\angle GJK = 70$. Determine whether $\triangle GHK$ is an isosceles triangle and justify your answer.



G.G.32: EXTERIOR ANGLE THEOREM

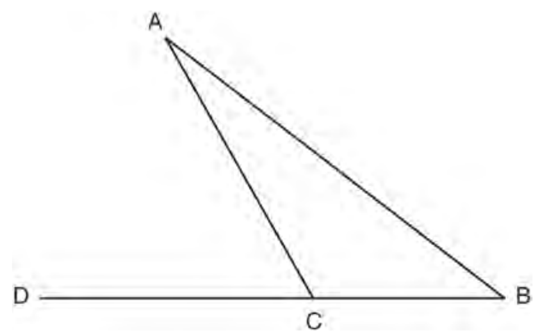
168 Side $\overline{PQ}$ of $\triangle PQR$ is extended through Q to point T. Which statement is *not* always true?
1 $m\angle RQT > m\angle R$
2 $m\angle RQT > m\angle P$
3 $m\angle RQT = m\angle P + m\angle R$
4 $m\angle RQT > m\angle PQR$

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



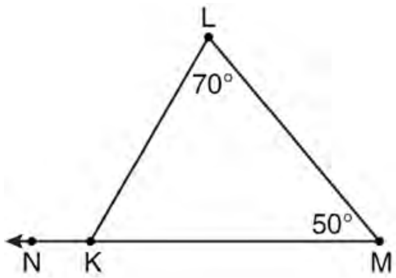
If $m\angle BCD = 6x + 2$, $m\angle BAC = 3x + 15$, and $m\angle ABC = 2x - 1$, what is the value of x?
1 12
2 $14\frac{10}{11}$
3 16
4 $18\frac{1}{9}$

170 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 $m\angle ACD = 5x + 5$.



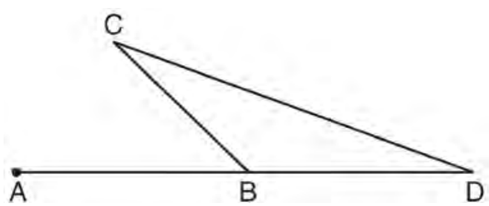
What is $m\angle B$?
1 5
2 20
3 25
4 55

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



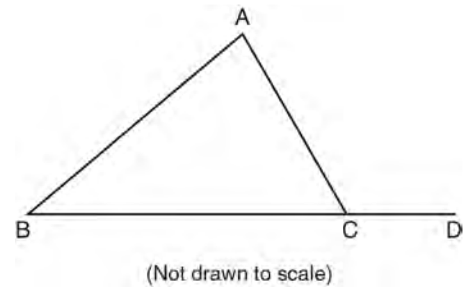
What is the measure of $\angle LKN$?
1 60º
2 120º
3 180º
4 300º

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



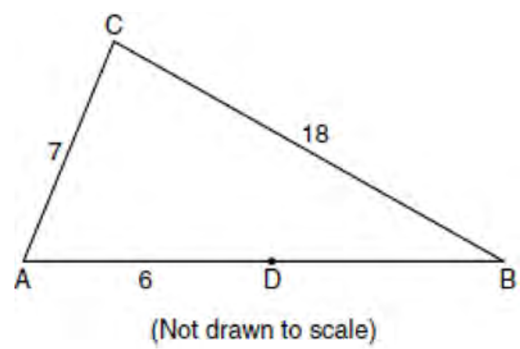
Which statement must be true?
1 $m\angle C > m\angle D$
2 $m\angle ABC < m\angle D$
3 $m\angle ABC > m\angle C$
4 $m\angle ABC > m\angle C + m\angle D$

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



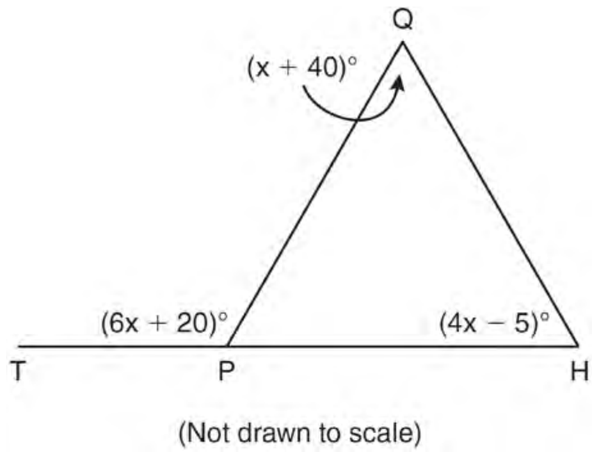
If $m\angle A = x^2 - 6x$, $m\angle B = 2x - 3$, and $m\angle ACD = 9x + 27$, what is the value of x?
1 10
2 2
3 3
4 15

174 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

175 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 $m\angle QPT$.



G.G.33: TRIANGLE INEQUALITY THEOREM

176 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

177 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 $\{26, 8, 15\}$

178 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 $3 < AC < 7$

G.G.34: ANGLE SIDE RELATIONSHIP

179 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 $BC < AC < AB$

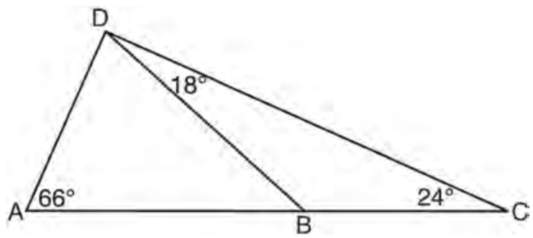
180 In $\triangle PQR$, $PQ = 8$, $QR = 12$, and $RP = 13$. Which statement about the angles of $\triangle PQR$ must be true?
1 $m\angle Q > m\angle P > m\angle R$
2 $m\angle Q > m\angle R > m\angle P$
3 $m\angle R > m\angle P > m\angle Q$
4 $m\angle P > m\angle R > m\angle Q$

181 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 $\angle C, \angle A, \angle B$

182 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 $\overline{BC}, \overline{AB}, \overline{AC}$

183 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 $RS < TS < RT$

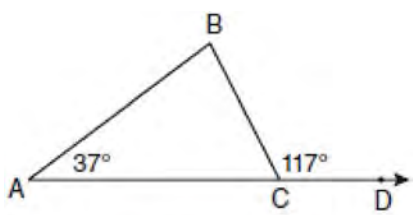
184 As shown in the diagram of $\triangle ACD$ below, B is a point on $\overline{AC}$ and $\overline{DB}$ is drawn.



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 $\overline{BD}$

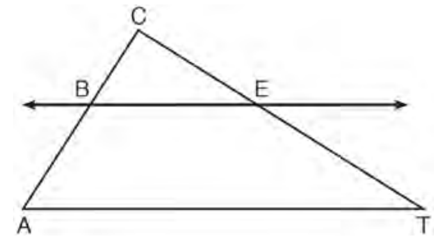
185 In the diagram below of $\triangle ABC$ with side $\overline{AC}$ extended through D, m$\angle A$ = 37 and m$\angle BCD$ = 117. Which side of $\triangle ABC$ is the longest side? Justify your answer.



(Not drawn to scale)

G.G.46: SIDE SPLITTER THEOREM

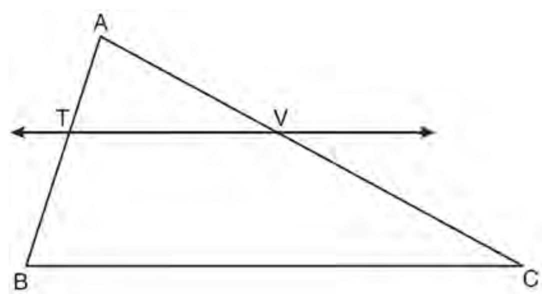
186 In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overline{AT}$.



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

1 5
2 14
3 20
4 26

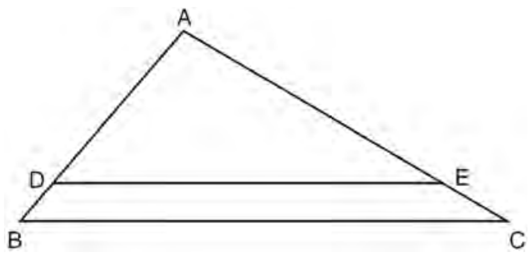
187 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.



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

1 $3\frac{1}{2}$
2 $7\frac{1}{7}$
3 14
4 24

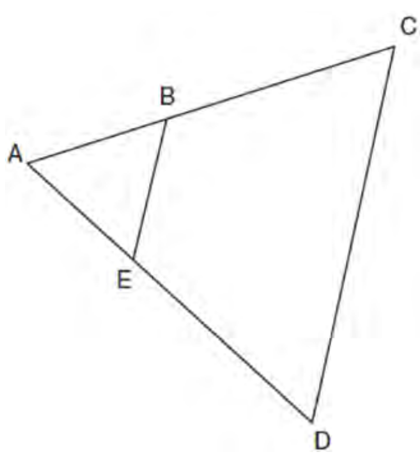
188 In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.



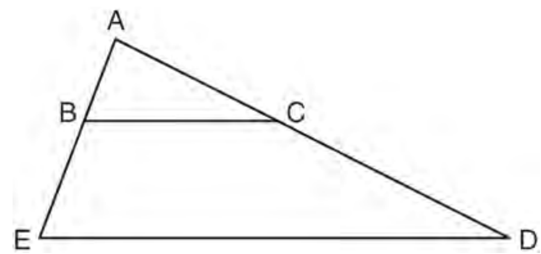
If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?
1 6
2 2
3 3
4 15

189 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

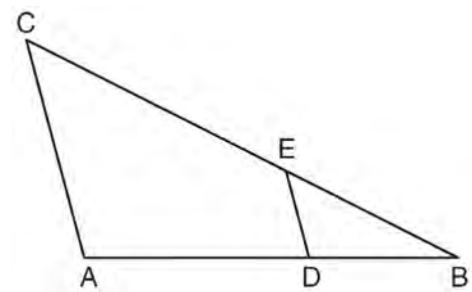
190 In the diagram below of $\triangle ACD$, E is a point on $\overline{AD}$ and B is a point on $\overline{AC}$, such that $\overline{EB} \parallel \overline{DC}$. If $AE = 3$, $ED = 6$, and $DC = 15$, find the length of $\overline{EB}$.



191 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 $\overline{AC}$.

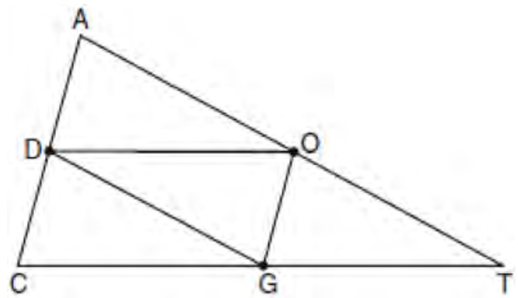


192 In the diagram below of $\triangle ABC$, D is a point on $\overline{AB}$, E is a point on $\overline{BC}$, $\overline{AC} \parallel \overline{DE}$, $CE = 25$ inches, $AD = 18$ inches, and $DB = 12$ inches. Find, to the *nearest tenth of an inch*, the length of $\overline{EB}$.



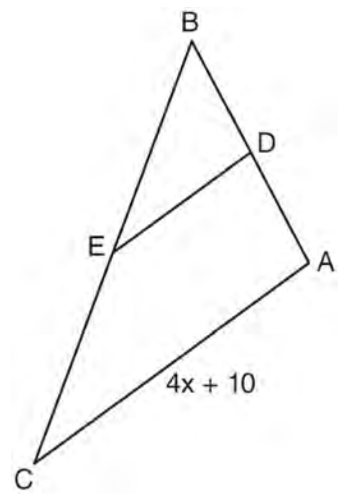
G.G.42: MIDSEGMENTS

193 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 $\overline{CT}$.



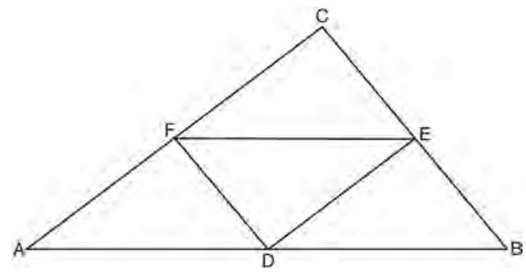
If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?
1 21
2 25
3 32
4 40

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



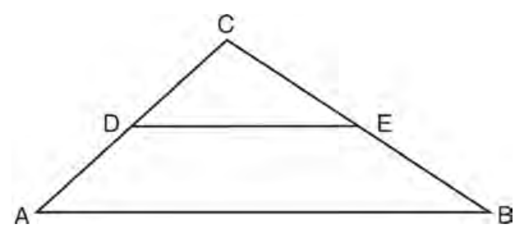
If $AC = 4x + 10$, which expression represents DE?
1 $x + 2.5$
2 $2x + 5$
3 $2x + 10$
4 $8x + 20$

195 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

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



Which statement is *not* true?

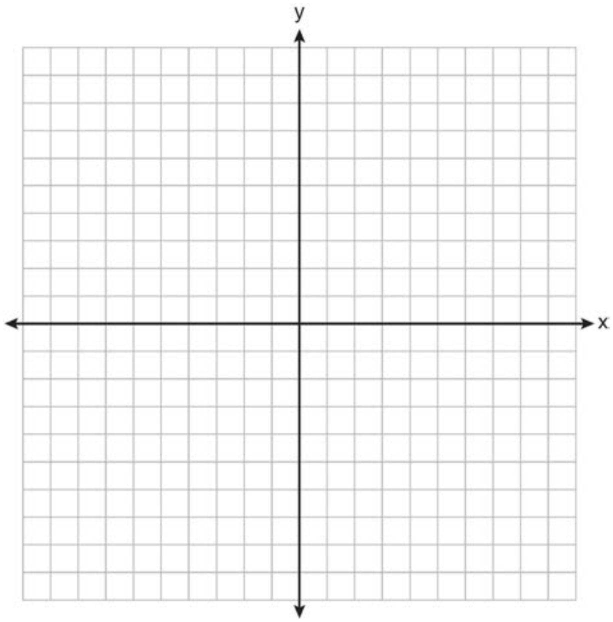
1 $CE = \frac{1}{2} CB$

2 $DE = \frac{1}{2} AB$

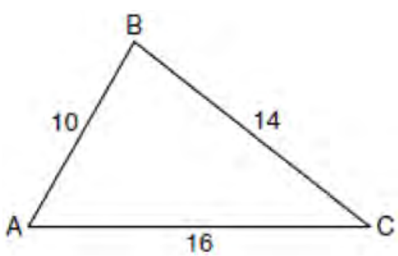
3 area of $\triangle CDE = \frac{1}{2}$ area of $\triangle CAB$

4 perimeter of $\triangle CDE = \frac{1}{2}$ perimeter of $\triangle CAB$

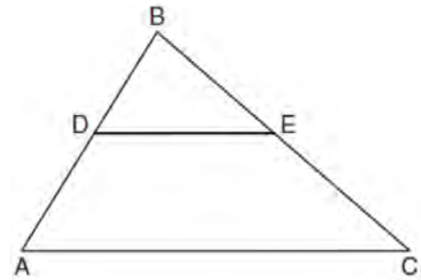
197 On the set of axes below, graph and label $\triangle DEF$ with vertices at $D(-4,-4)$, $E(-2,2)$, and $F(8,-2)$. If G is the midpoint of $\overline{EF}$ and H is the midpoint of $\overline{DF}$, state the coordinates of G and H and label each point on your graph. Explain why $\overline{GH} \parallel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



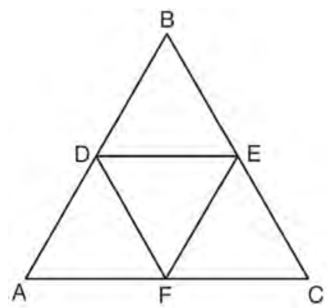
198 In the diagram of $\triangle ABC$ below, $AB = 10$, $BC = 14$, and $AC = 16$. Find the perimeter of the triangle formed by connecting the midpoints of the sides of $\triangle ABC$.



199 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 $\triangle ABC$.

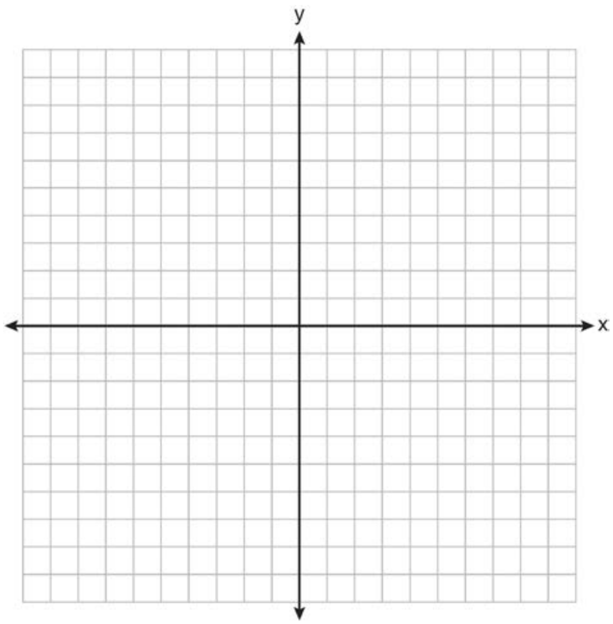


200 In the diagram below, the vertices of $\triangle DEF$ are the midpoints of the sides of equilateral triangle ABC, and the perimeter of $\triangle ABC$ is 36 cm.



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

201 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.]



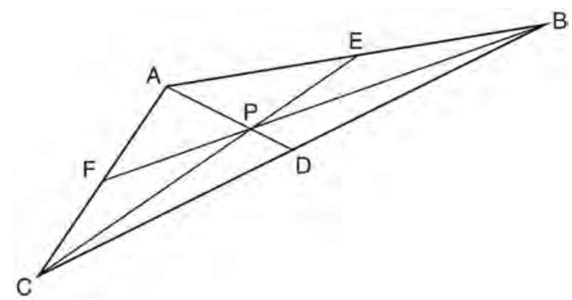
G.G.21: CENTROID, ORTHOCENTER, INCENTER AND CIRCUMCENTER

202 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

203 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

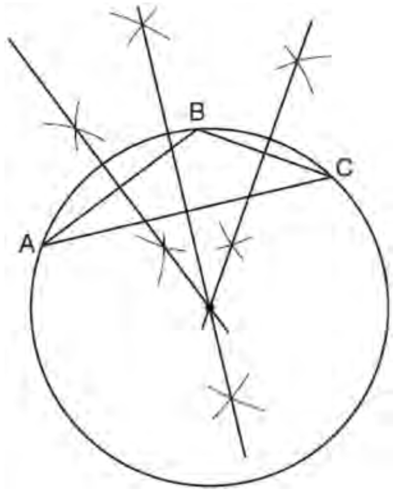
204 For a triangle, which two points of concurrence could be located outside the triangle?
1 incenter and centroid
2 centroid and orthocenter
3 incenter and circumcenter
4 circumcenter and orthocenter

205 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

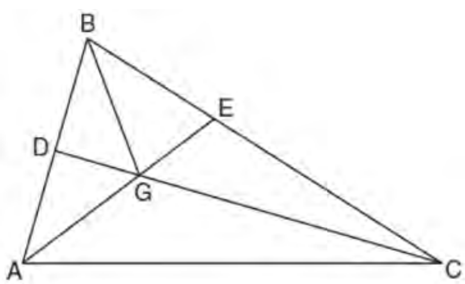
206 The diagram below shows the construction of the center of the circle circumscribed about $\triangle ABC$.



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 $\triangle ABC$

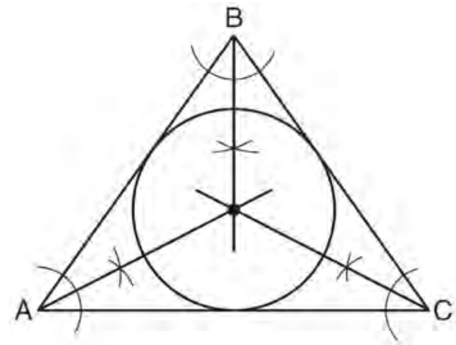
207 In the diagram below of $\triangle ABC$, $\overline{CD}$ is the bisector of $\angle BCA$, $\overline{AE}$ is the bisector of $\angle CAB$, and $\overline{BG}$ is drawn.



Which statement must be true?

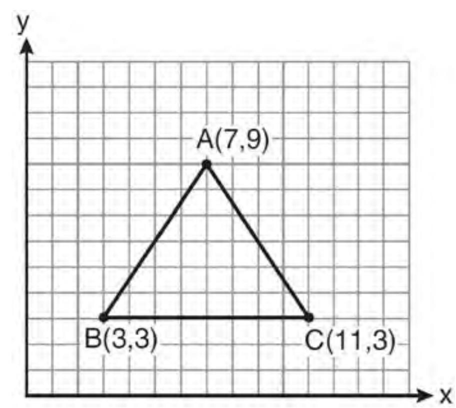
1 $DG = EG$
2 $AG = BG$
3 $\angle AEB \cong \angle AEC$
4 $\angle DBG \cong \angle EBG$

208 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.

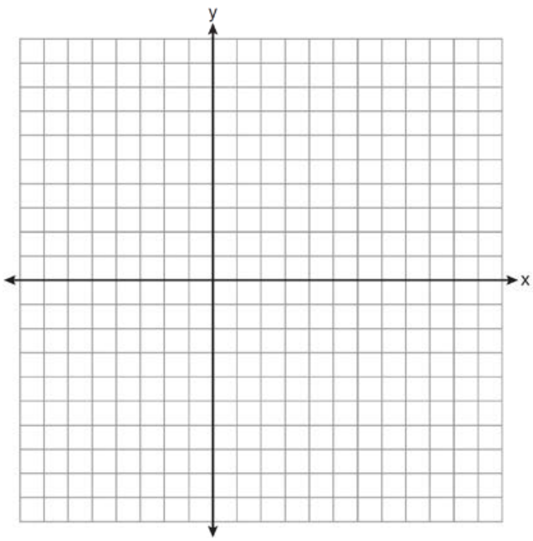
209 The vertices of the triangle in the diagram below are $A(7,9)$, $B(3,3)$, and $C(11,3)$.



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

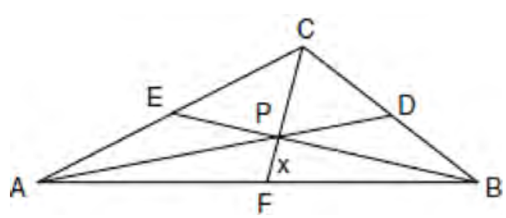
1 $(5,6)$
2 $(7,3)$
3 $(7,5)$
4 $(9,6)$

210 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.]



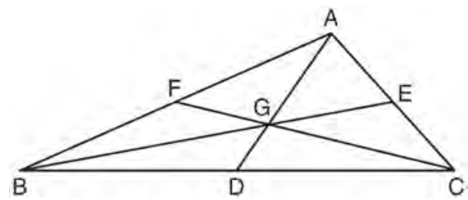
G.G.43: CENTROID

211 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.



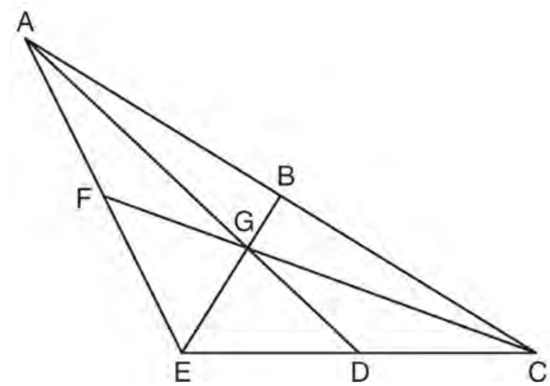
If $PF = x$, which equation can be used to find x?
1 $x + x = 6$
2 $2x + x = 6$
3 $3x + 2x = 6$
4 $x + \frac{2}{3}x = 6$

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



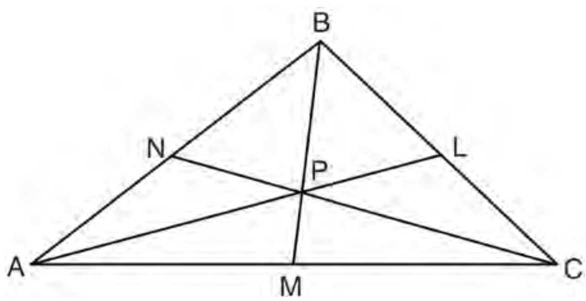
If $CF = 24$, what is the length of $\overline{FG}$?
1 8
2 10
3 12
4 16

213 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.



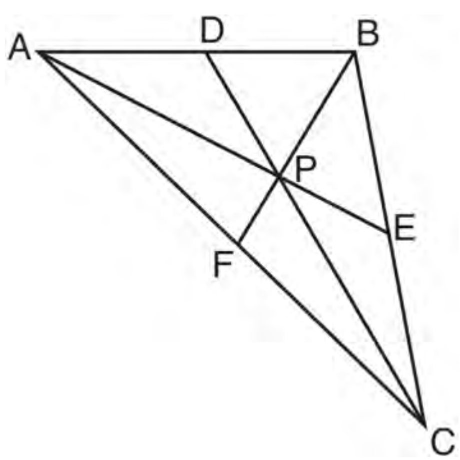
What is the length, in centimeters, of $\overline{GC}$?
1 24
2 12
3 6
4 4

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



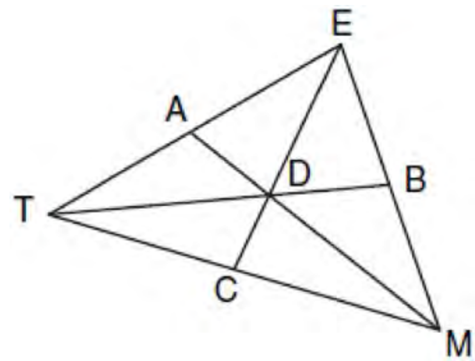
If $PM = 2x + 5$ and $BP = 7x + 4$, what is the length of $\overline{PM}$?
1 9
2 2
3 18
4 27

215 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

216 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 $\overline{TD}$.



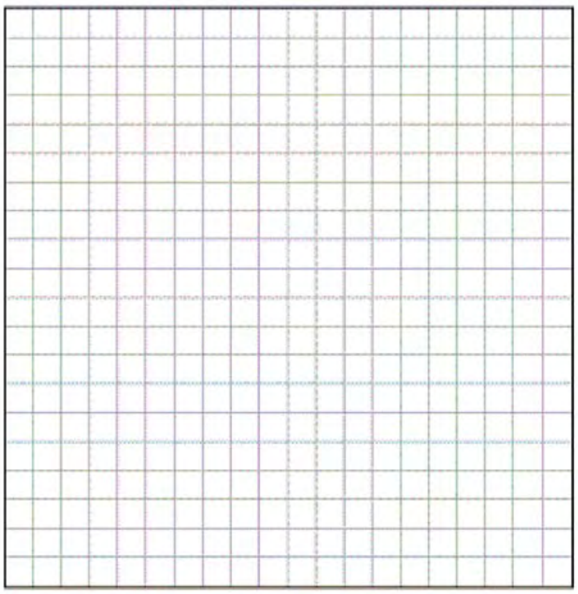
G.G.69: TRIANGLES IN THE COORDINATE PLANE

217 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 $m\angle ABC = 60$

218 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

219 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

220 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.]



POLYGONS

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

221 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

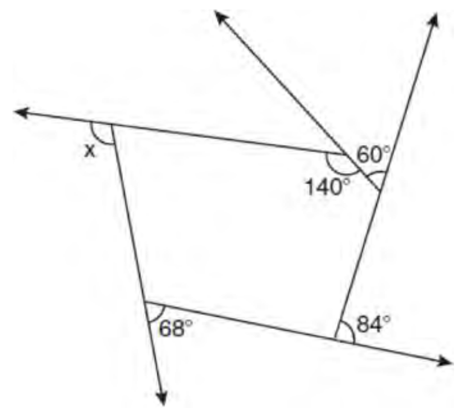
222 For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?

1 hexagon
2 pentagon
3 quadrilateral
4 triangle

223 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 $\frac{(n-2)\cdot 180}{n}$

224 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

225 The number of degrees in the sum of the interior angles of a pentagon is

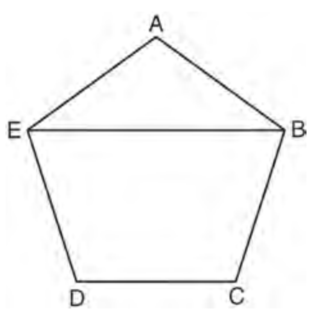
1 72
2 360
3 540
4 720

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

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

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

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

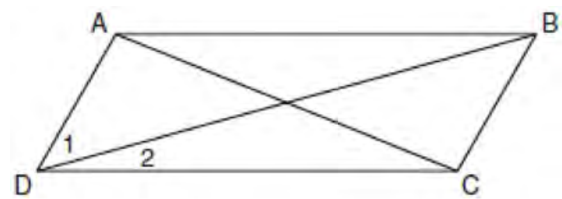


What is the measure of $\angle AEB$?
1 36º
2 54º
3 72º
4 108º

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

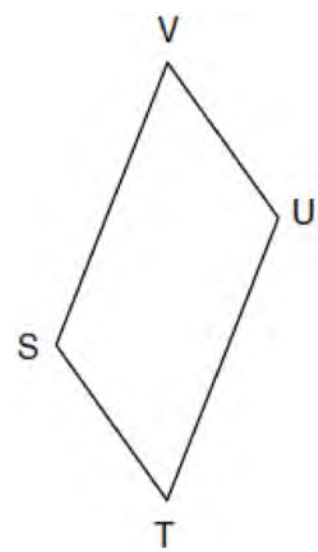
G.G.38: PARALLELOGRAMS

230 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

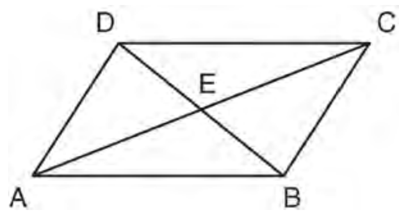
231 In the diagram below of parallelogram *STUV*, $SV = x + 3$, $VU = 2x - 1$, and $TU = 4x - 3$.



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

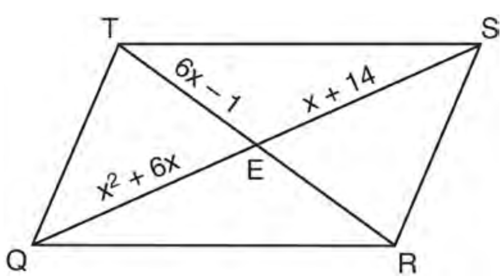
232 Which statement is true about every parallelogram?
1 All four sides are congruent.
2 The interior angles are all congruent.
3 Two pairs of opposite sides are congruent.
4 The diagonals are perpendicular to each other.

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



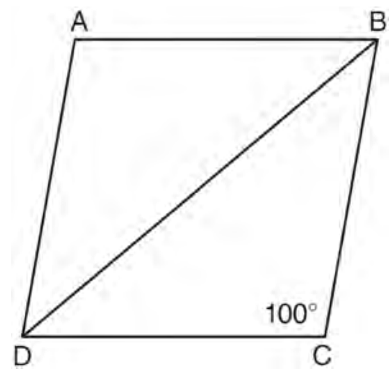
Which expression is *not* always true?
1 $\angle DAE \cong \angle BCE$
2 $\angle DEC \cong \angle BEA$
3 $\overline{AC} \cong \overline{DB}$
4 $\overline{DE} \cong \overline{EB}$

234 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.



G.G.39: PARALLELOGRAMS

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



What is $m\angle DBC$?
1 40
2 45
3 50
4 80

236 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

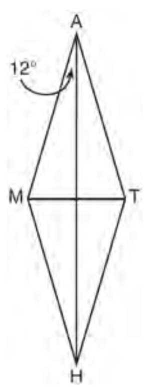
237 Which quadrilateral has diagonals that always bisect its angles and also bisect each other?
1 rhombus
2 rectangle
3 parallelogram
4 isosceles trapezoid

238 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

239 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

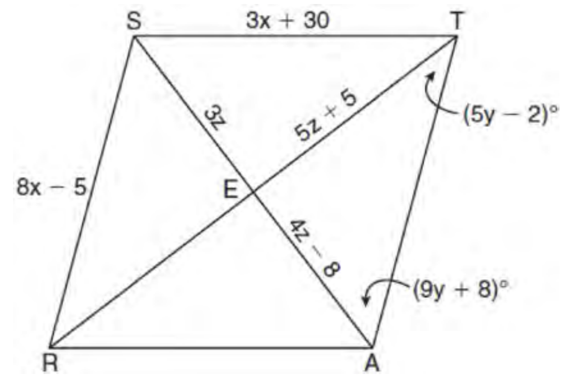
240 Which reason could be used to prove that a parallelogram is a rhombus?
1 Diagonals are congruent.
2 Opposite sides are parallel.
3 Diagonals are perpendicular.
4 Opposite angles are congruent.

241 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

242 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 $m\angle TAS$.



G.G.40: TRAPEZOIDS

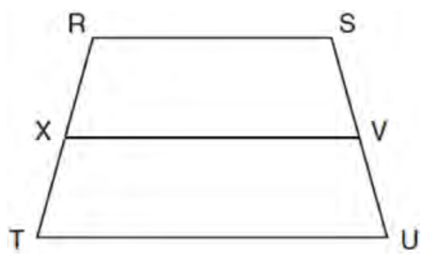
243 If the diagonals of a quadrilateral do *not* bisect each other, then the quadrilateral could be a
1 rectangle
2 rhombus
3 square
4 trapezoid

244 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 $\frac{1}{2}$

245 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

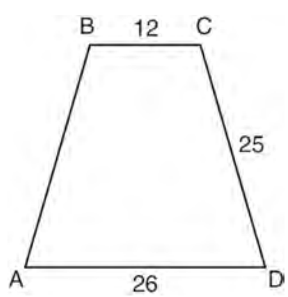
Geometry Regents Exam Questions by Performance Indicator: Topic

246 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 $\overline{SU}$.



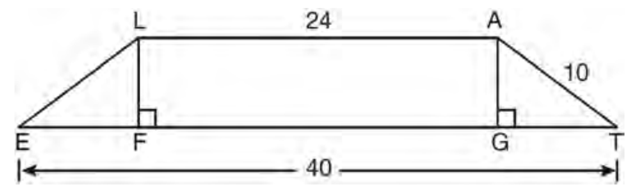
If $RS = 30$ and $XV = 44$, what is the length of $\overline{TU}$?
1 37
2 58
3 74
4 118

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



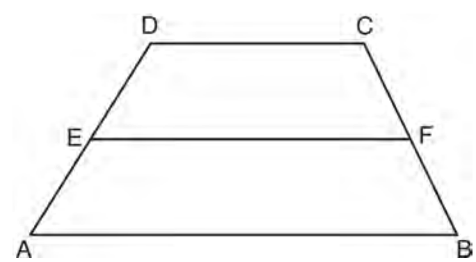
What is the length of an altitude of the trapezoid?
1 7
2 14
3 19
4 24

248 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.



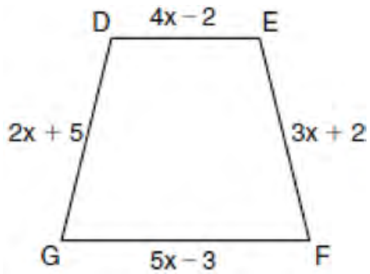
What is the length of $\overline{LF}$?
1 6
2 8
3 3
4 4

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

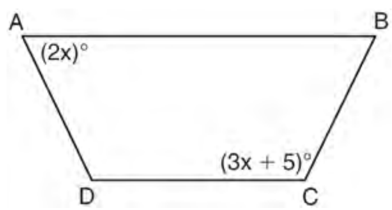


If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of *x*?
1 5
2 2
3 7
4 8

250 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.



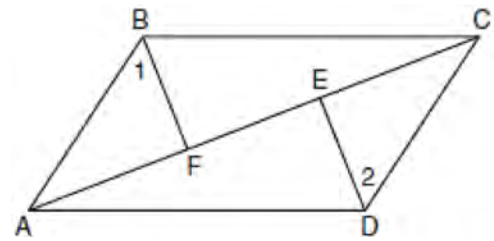
251 The diagram below shows isosceles trapezoid $ABCD$ with $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \cong \overline{BC}$. If $m\angle BAD = 2x$ and $m\angle BCD = 3x + 5$, find $m\angle BAD$.



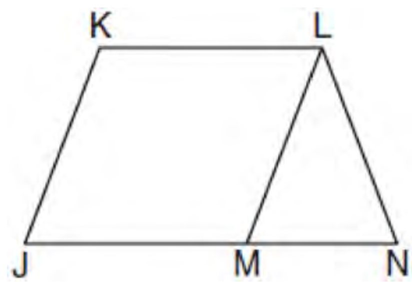
G.G.41: SPECIAL QUADRILATERALS

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

253 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.



254 Given: $JKLM$ is a parallelogram.
$\overline{JM} \cong \overline{LN}$
$\angle LMN \cong \angle LNM$
Prove: $JKLM$ is a rhombus.



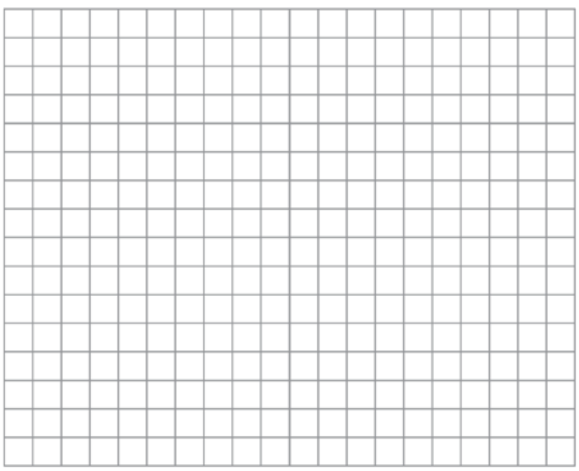
G.G.69: QUADRILATERALS IN THE COORDINATE PLANE

255 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 $\overline{BD}$

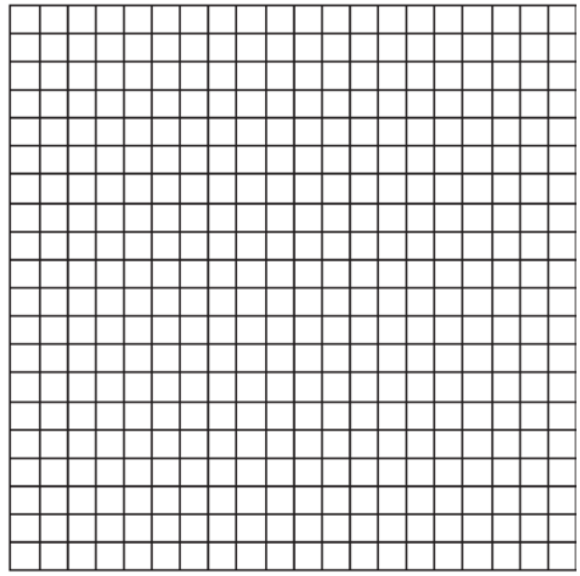
256 Parallelogram *ABCD* has coordinates $A(1,5)$, $B(6,3)$, $C(3,-1)$, and $D(-2,1)$. What are the coordinates of *E*, the intersection of diagonals $\overline{AC}$ and $\overline{BD}$?

1 $(2,2)$
2 $(4.5,1)$
3 $(3.5,2)$
4 $(-1,3)$

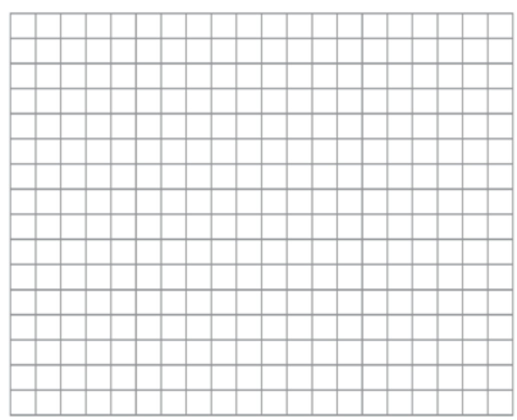
257 Given: Quadrilateral *ABCD* has vertices $A(-5,6)$, $B(6,6)$, $C(8,-3)$, and $D(-3,-3)$.
Prove: Quadrilateral *ABCD* is a parallelogram but is neither a rhombus nor a rectangle. [The use of the grid below is optional.]



258 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.]

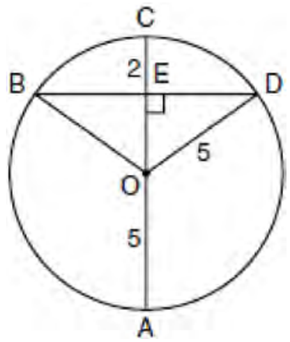


259 Given: ΔABC with vertices $A(-6,-2)$, $B(2,8)$, and $C(6,-2)$. $\overline{AB}$ has midpoint *D*, $\overline{BC}$ has midpoint *E*, and $\overline{AC}$ has midpoint *F*.
Prove: *ADEF* is a parallelogram
ADEF is *not* a rhombus
[The use of the grid is optional.]



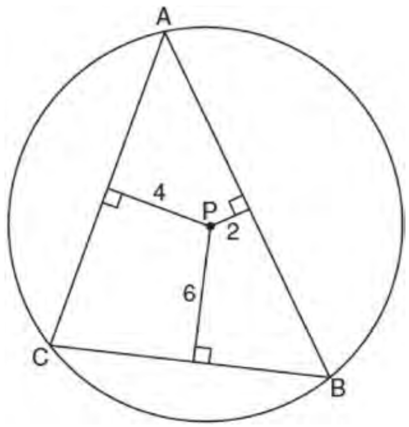
CONICS
G.G.49: CHORDS

260 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.



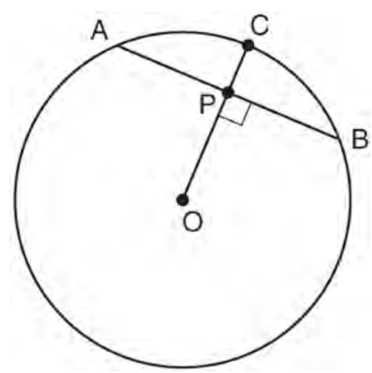
What is the length of $\overline{BD}$?
1 12
2 10
3 8
4 4

261 In the diagram below, ΔABC is inscribed in circle P. The distances from the center of circle P to each side of the triangle are shown.



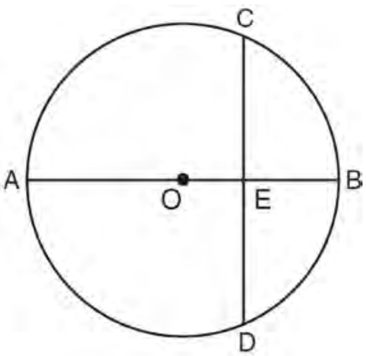
Which statement about the sides of the triangle is true?
1 $AB > AC > BC$
2 $AB < AC$ and $AC > BC$
3 $AC > AB > BC$
4 $AC = AB$ and $AB > BC$

262 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.



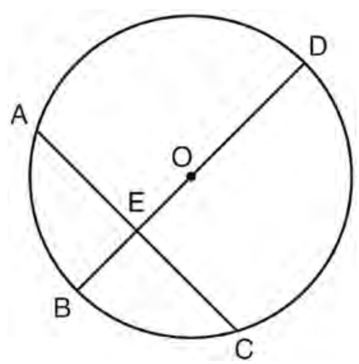
What is the length of $\overline{OP}$, in centimeters?
1 8
2 2
3 3
4 4

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



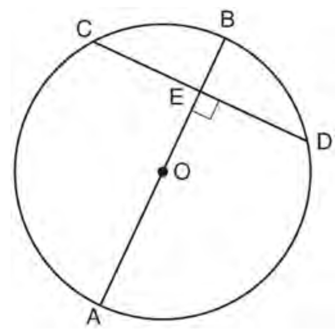
What is the length of $\overline{CE}$?
1 $4\sqrt{3}$
2 $2\sqrt{3}$
3 $8\sqrt{2}$
4 $4\sqrt{2}$

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



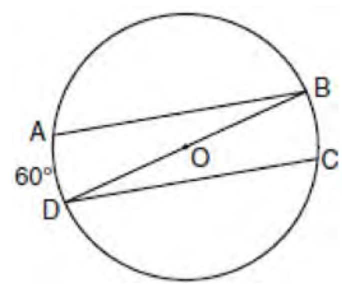
If $DB = 34$, $AC = 30$, and $DE > BE$, what is the length of $\overline{BE}$?
1 8
2 9
3 16
4 25

265 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 $\overline{CE}$.



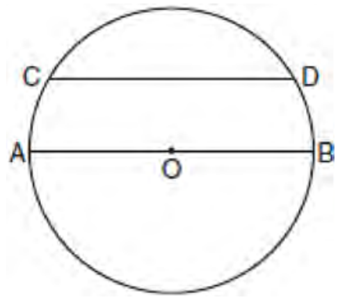
G.G.52: CHORDS

266 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

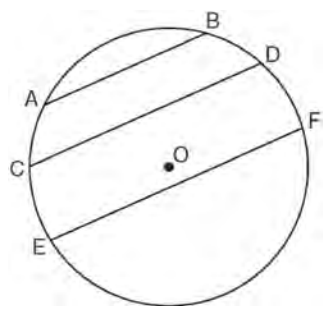
267 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{AC} = 30$.



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

1 150
2 120
3 100
4 60

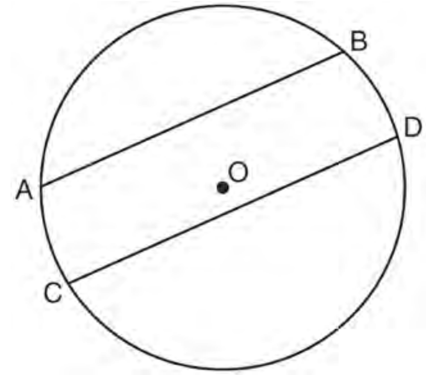
268 In the diagram below of circle O, chord $\overline{AB} \parallel$ chord $\overline{CD}$, and chord $\overline{CD} \parallel$ chord $\overline{EF}$.



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 $\overset{\frown}{EF} \cong \overset{\frown}{CD}$

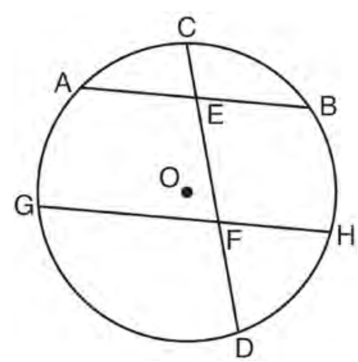
269 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



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 $\overset{\frown}{ABD} \cong \overset{\frown}{CDB}$

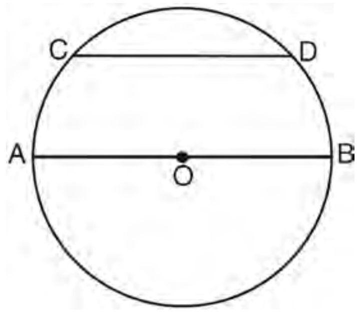
270 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{GH}$. Chord $\overline{CD}$ intersects $\overline{AB}$ at E and $\overline{GH}$ at F.



Which statement must always be true?

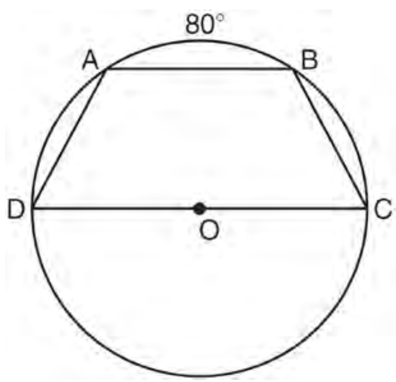
1 $\overset{\frown}{AC} \cong \overset{\frown}{CB}$
2 $\overset{\frown}{DH} \cong \overset{\frown}{BH}$
3 $\overset{\frown}{AB} \cong \overset{\frown}{GH}$
4 $\overset{\frown}{AG} \cong \overset{\frown}{BH}$

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

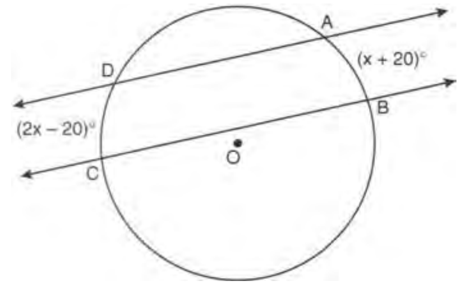


If $m\widehat{CD} = 70$, what is $m\widehat{AC}$?
1 110
2 70
3 55
4 35

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

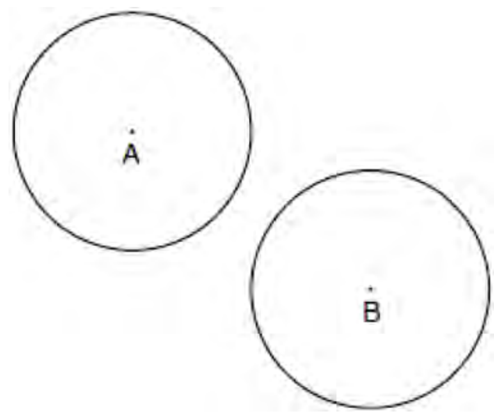


273 In the diagram below, two parallel lines intersect circle O at points A, B, C, and D, with $m\widehat{AB} = x + 20$ and $m\widehat{DC} = 2x - 20$. Find $m\widehat{AB}$.



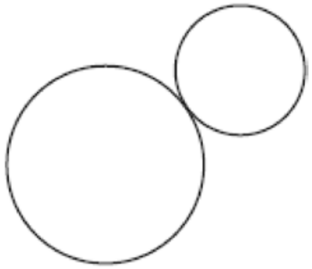
G.G.50: TANGENTS

274 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

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



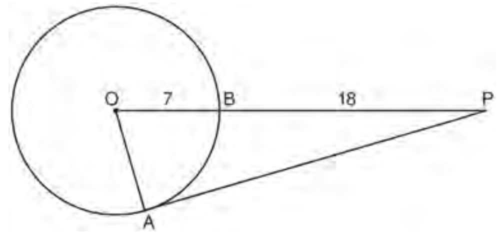
1 1
2 2
3 3
4 4

276 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

277 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°

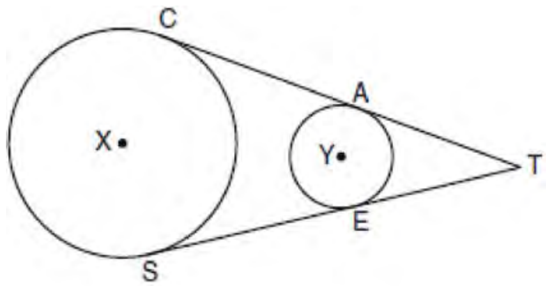
278 Tangents $\overline{PA}$ and $\overline{PB}$ are drawn to circle O from an external point, P, and radii $\overline{OA}$ and $\overline{OB}$ are drawn. If $m\angle APB = 40$, what is the measure of $\angle AOB$?
1 140º
2 100º
3 70º
4 50º

279 In the diagram below of ΔPAO, $\overline{AP}$ 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

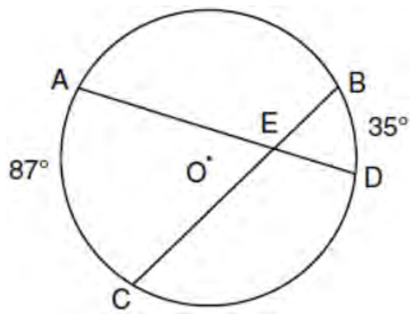
280 In the diagram below, circles X and Y have two tangents drawn to them from external point T. The points of tangency are C, A, S, and E. The ratio of TA to AC is $1:3$. If $TS = 24$, find the length of $\overline{SE}$.



(Not drawn to scale)

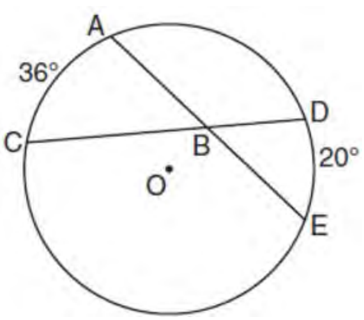
G.G.51: ARCS DETERMINED BY ANGLES

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



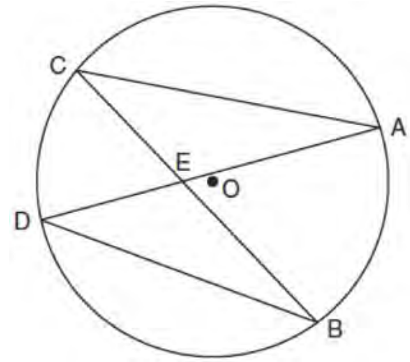
What is the degree measure of $\angle CEA$?
1 87
2 61
3 43.5
4 26

282 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 $m\overset{\frown}{DE} = 20$.



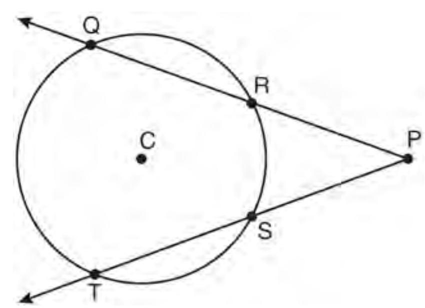
What is $m\angle ABC$?
1 56
2 36
3 28
4 8

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



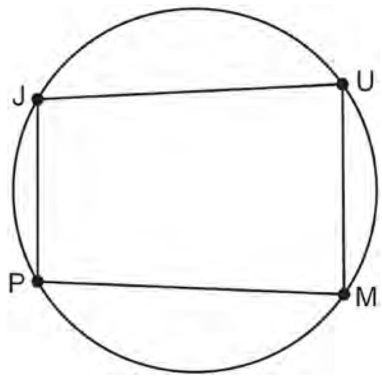
Which relationship must be true?
1 $\Delta CAE \cong \Delta DBE$
2 $\Delta AEC \sim \Delta BED$
3 $\angle ACB \cong \angle CBD$
4 $\overset{\frown}{CA} \cong \overset{\frown}{DB}$

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



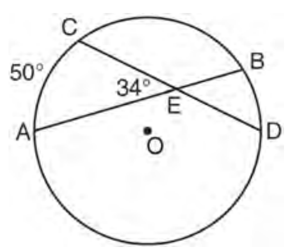
What is $m\overset{\frown}{RS}$?
1 50
2 60
3 90
4 110

285 In the diagram below, quadrilateral *JUMP* is inscribed in a circle..



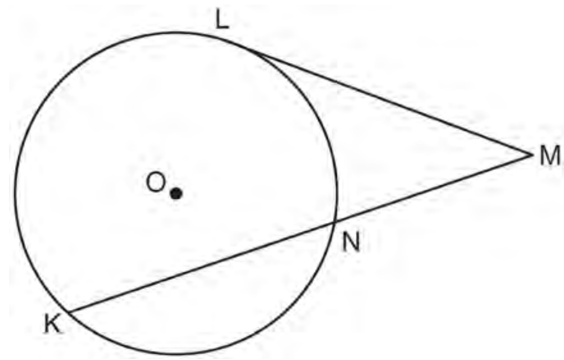
Opposite angles *J* and *M* must be
1 right
2 complementary
3 congruent
4 supplementary

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

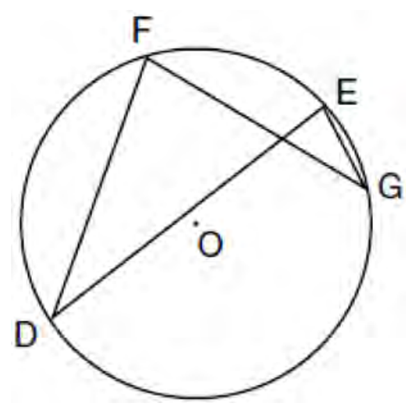


If $m\angle AEC = 34$ and $m\overset{\frown}{AC} = 50$, what is $m\overset{\frown}{DB}$?
1 16
2 18
3 68
4 118

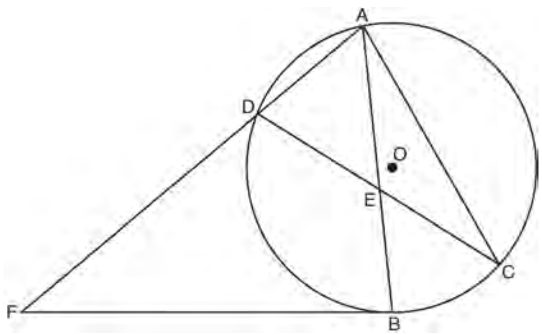
287 In the diagram below, tangent $\overline{ML}$ and secant $\overline{MNK}$ are drawn to circle *O*. The ratio $m\overset{\frown}{LN} : m\overset{\frown}{NK} : m\overset{\frown}{KL}$ is 3:4:5. Find $m\angle LMK$.



288 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.



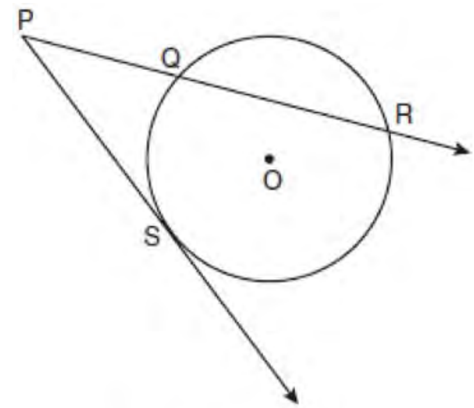
289 Chords $\overline{AB}$ and $\overline{CD}$ intersect at E in circle O, as shown in the diagram below. Secant $\overline{FDA}$ and tangent $\overline{FB}$ are drawn to circle O from external point F and chord $\overline{AC}$ is drawn. The $m\overset{\frown}{DA} = 56$, $m\overset{\frown}{DB} = 112$,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



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

G.G.53: SEGMENTS INTERCEPTED BY CIRCLE

290 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 $PR = x + 18$.

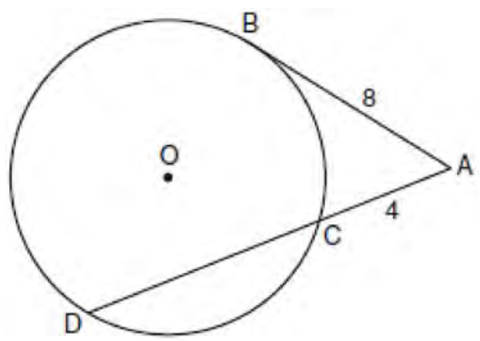


(Not drawn to scale)

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

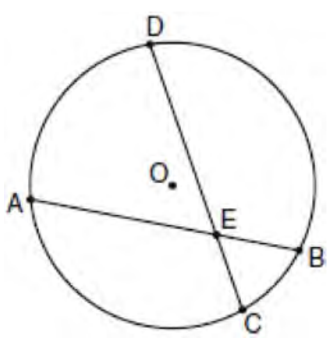
1 6
2 9
3 3
4 27

291 In the diagram below, tangent $\overline{AB}$ and secant $\overline{ACD}$ are drawn to circle O from an external point A, $AB = 8$, and $AC = 4$.



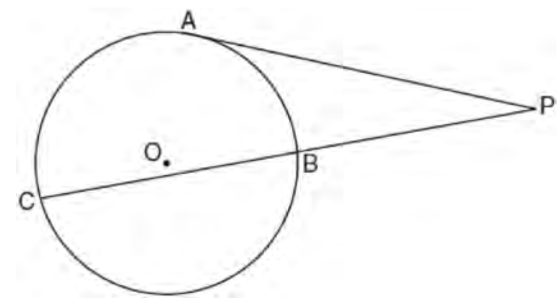
What is the length of $\overline{CD}$?
1 16
2 13
3 12
4 10

292 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 $EB = 4$.



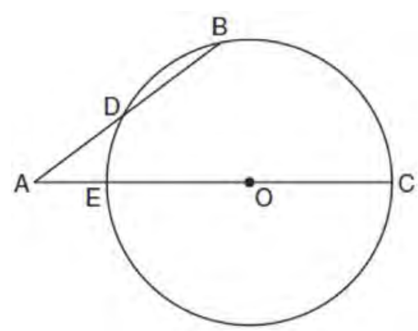
What is the value of x?
1 1
2 3.6
3 5
4 10.25

293 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

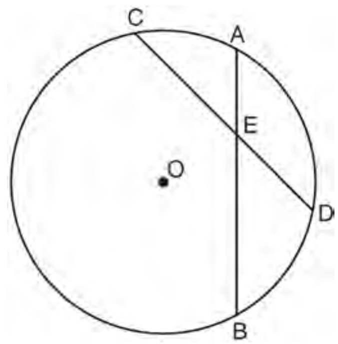
294 In the diagram below of circle O, secant $\overline{AB}$ intersects circle O at D, secant $\overline{AOC}$ intersects circle O at E, $AE = 4$, $AB = 12$, and $DB = 6$.



(Not drawn to scale)

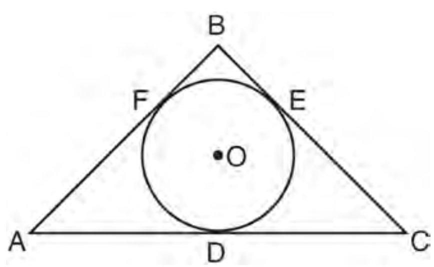
What is the length of $\overline{OC}$?
1 4.5
2 7
3 9
4 14

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



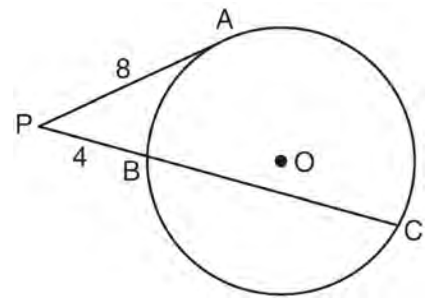
If $CE = 10$, $ED = 6$, and $AE = 4$, what is the length of $\overline{EB}$?
1 15
2 12
3 6.7
4 2.4

296 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 $BE = 4$.



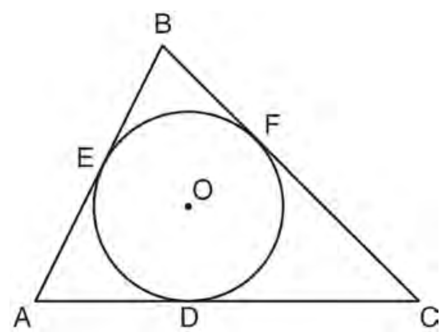
What is the perimeter of $\triangle ABC$?
1 15
2 25
3 30
4 60

297 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.



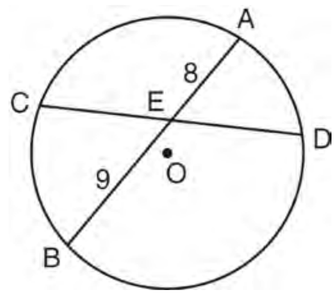
If $PA = 8$ and $PB = 4$, what is the length of $\overline{BC}$?
1 20
2 16
3 15
4 12

298 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.

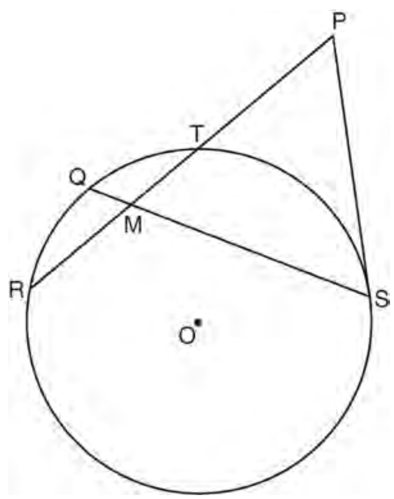


If $AB = 20$, $AE = 12$, and $CF = 15$, what is the length of $\overline{AC}$?
1 8
2 15
3 23
4 27

299 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.



300 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 $\overline{PS}$.

G.G.71: EQUATIONS OF CIRCLES

301 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 $(x+2)^2 + (y+3)^2 = 4$

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

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

304 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 $(x+7)^2 + (y-3)^2 = 16$

305 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 $(x-1)^2 + (y+4)^2 = 25$

306 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 $(x-2)^2+(y+8)^2=81$

307 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 $(x-4)^2+y^2=36$

308 The equation of a circle with its center at $(-3,5)$ and a radius of 4 is

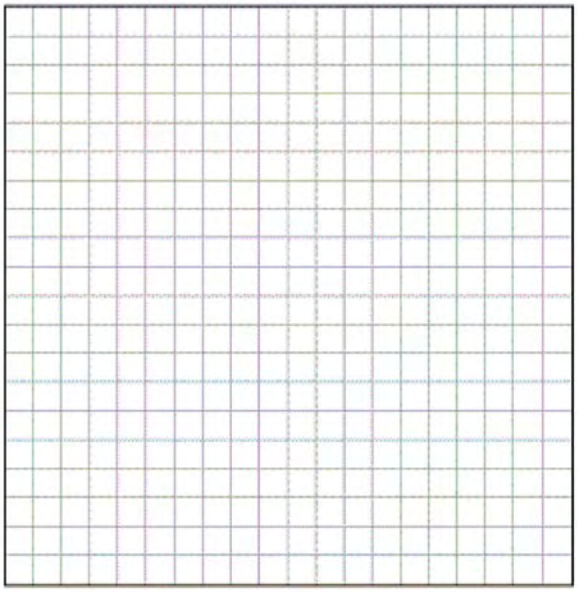
1 $(x+3)^2+(y-5)^2=4$

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

3 $(x+3)^2+(y-5)^2=16$

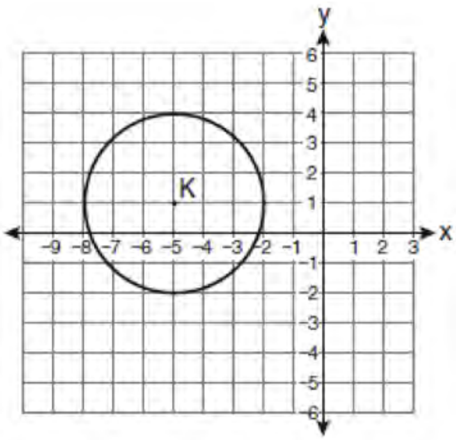
4 $(x-3)^2+(y+5)^2=16$

309 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.]



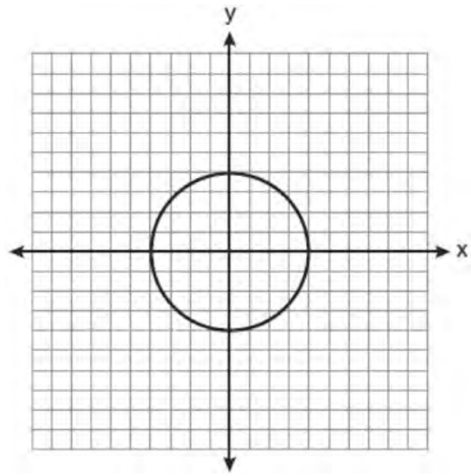
G.G.72: EQUATIONS OF CIRCLES

310 Which equation represents circle K shown in the graph below?



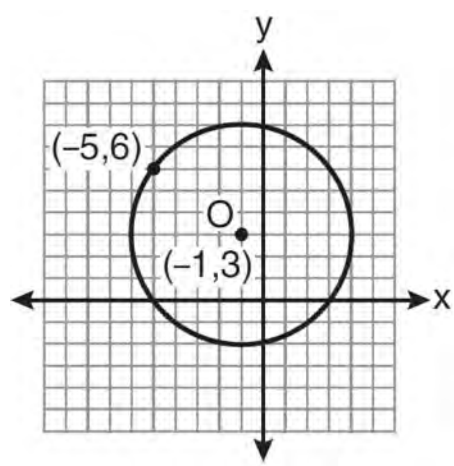
1 $(x+5)^2+(y-1)^2=3$
2 $(x+5)^2+(y-1)^2=9$
3 $(x-5)^2+(y+1)^2=3$
4 $(x-5)^2+(y+1)^2=9$

311 What is an equation for the circle shown in the graph below?



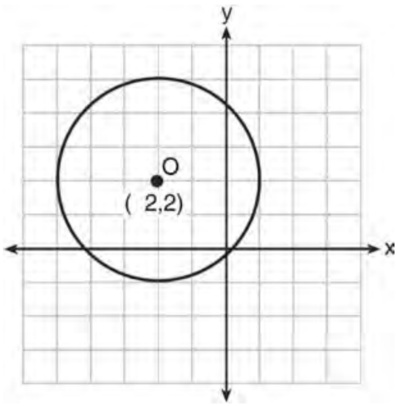
1 $x^2+y^2=2$
2 $x^2+y^2=4$
3 $x^2+y^2=8$
4 $x^2+y^2=16$

312 What is an equation of circle O shown in the graph below?



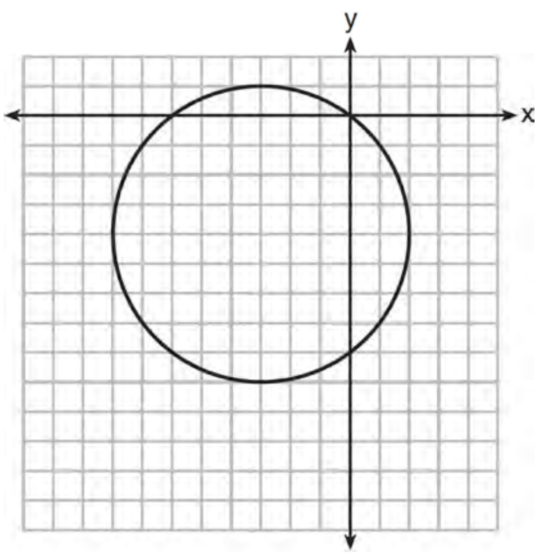
1 $(x+1)^2+(y-3)^2=25$
2 $(x-1)^2+(y+3)^2=25$
3 $(x-5)^2+(y+6)^2=25$
4 $(x+5)^2+(y-6)^2=25$

313 What is an equation of circle *O* shown in the graph below?



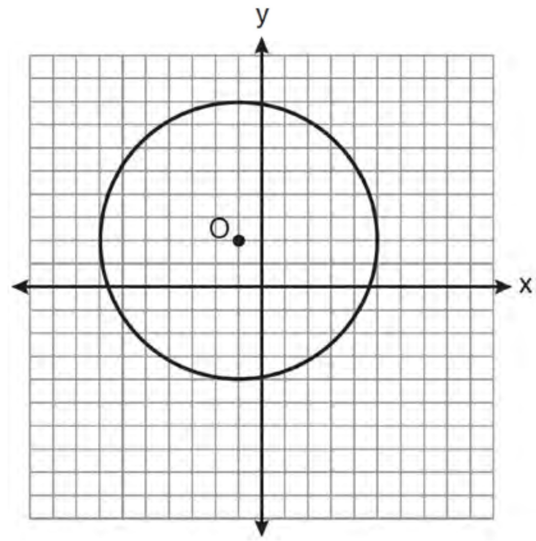
1 $(x+2)^2+(y-2)^2=9$
2 $(x+2)^2+(y-2)^2=3$
3 $(x-2)^2+(y+2)^2=9$
4 $(x-2)^2+(y+2)^2=3$

314 What is an equation of the circle shown in the graph below?

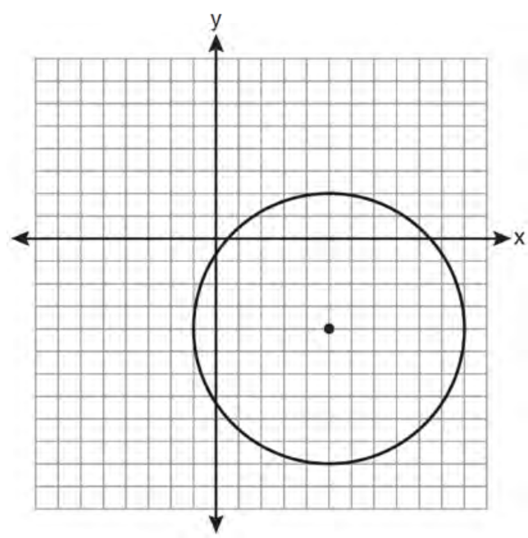


1 $(x-3)^2+(y-4)^2=25$
2 $(x+3)^2+(y+4)^2=25$
3 $(x-3)^2+(y-4)^2=10$
4 $(x+3)^2+(y+4)^2=10$

315 Write an equation for circle *O* shown on the graph below.



316 Write an equation of the circle graphed in the diagram below.



G.G.73: EQUATIONS OF CIRCLES

317 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 = $\sqrt{C}$

318 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 $\sqrt{13}$

319 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

320 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

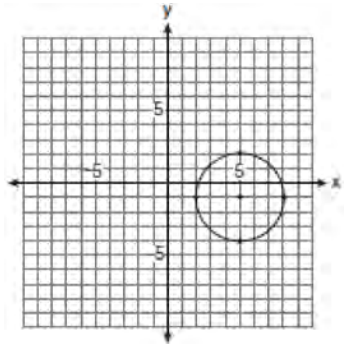
321 What are the center and the radius of the circle whose equation is $(x-5)^2+(y+3)^2=16$?
1 $(-5,3)$ and 16
2 $(5,-3)$ and 16
3 $(-5,3)$ and 4
4 $(5,-3)$ and 4

322 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

323 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 $(x-5)^2+(y-4)^2=25$

G.G.74: GRAPHING CIRCLES

324 Which graph represents a circle with the equation $(x-5)^2+(y+1)^2=9$?



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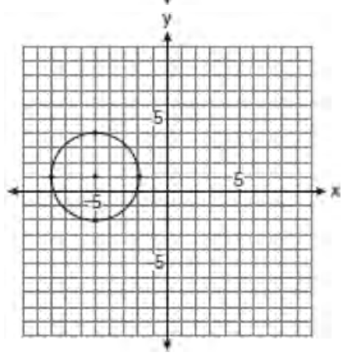

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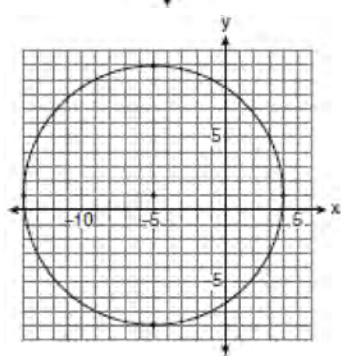

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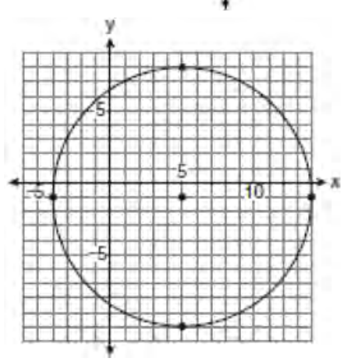
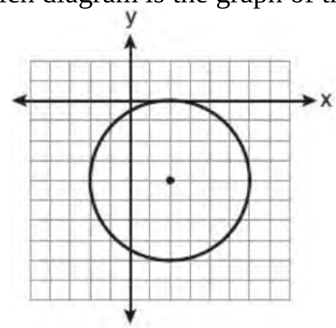


4

325 The equation of a circle is $(x-2)^2+(y+4)^2=4$. Which diagram is the graph of the circle?



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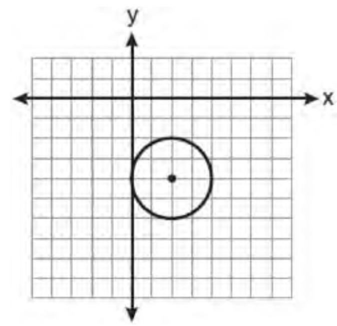

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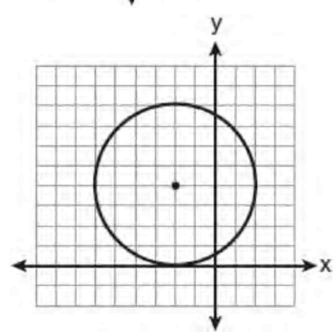

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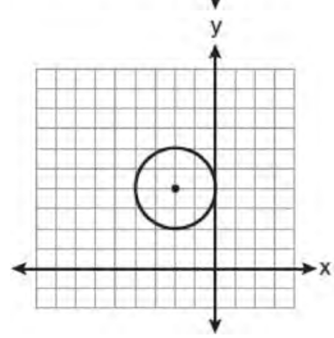
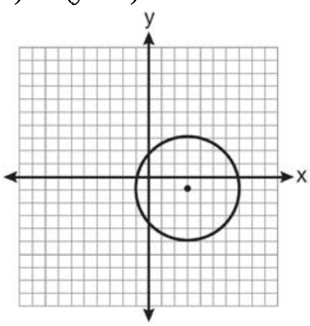


4

326 Which graph represents a circle with the equation $(x-3)^2+(y+1)^2=4$?



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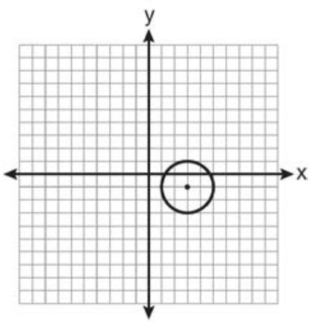

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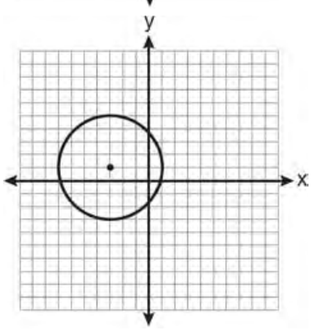

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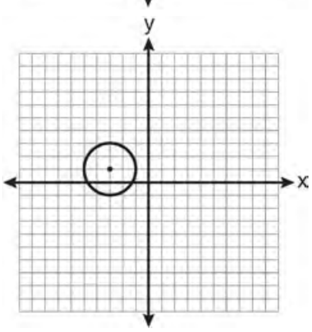
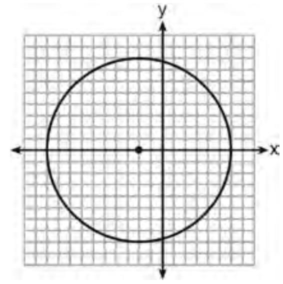


4

327 Which graph represents a circle whose equation is $(x+2)^2+y^2=16$?



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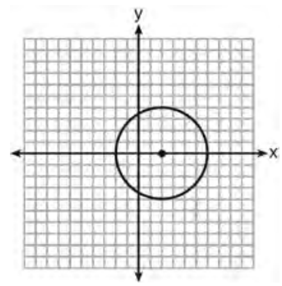

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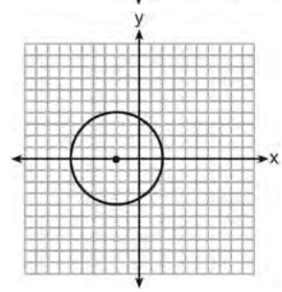

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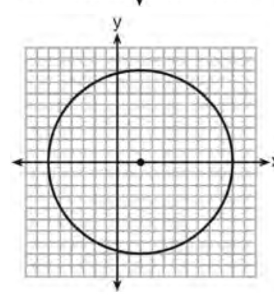


4

MEASURING IN THE PLANE AND SPACE

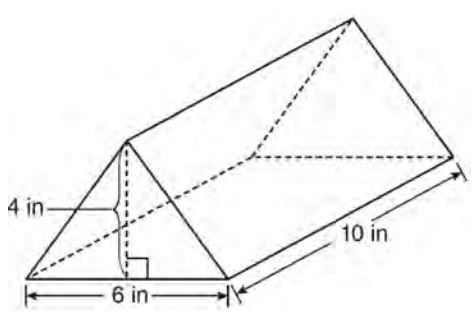
G.G.11: VOLUME

328 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.

G.G.12: VOLUME

329 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 $x^2 + 6x + 8$

330 A packing carton in the shape of a triangular prism is shown in the diagram below.



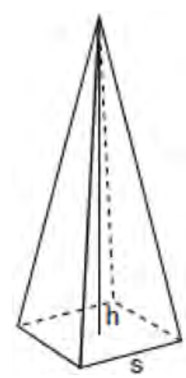
What is the volume, in cubic inches, of this carton?
1 20
2 60
3 120
4 240

331 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

332 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.

G.G.13: VOLUME

333 A regular pyramid with a square base is shown in the diagram below.



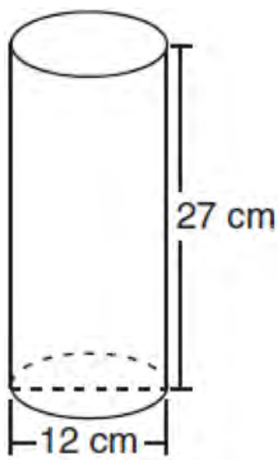
A side, *s*, of the base of the pyramid is 12 meters, and the height, *h*, is 42 meters. What is the volume of the pyramid in cubic meters?

334 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.

G.G.14: VOLUME AND LATERAL AREA

335 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

336 Which expression represents the volume, in cubic centimeters, of the cylinder represented in the diagram below?



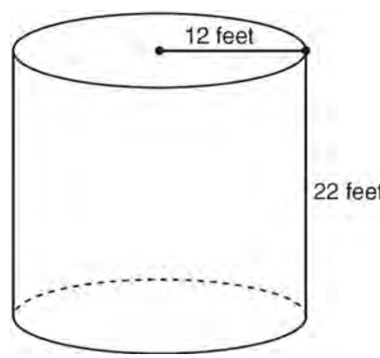
1 162π
2 324π
3 972π
4 $3,888\pi$

337 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

338 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 $2,160\pi$

339 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.

340 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?

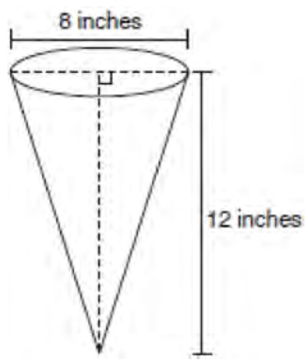


341 A cylinder has a height of 7 cm and a base with a diameter of 10 cm. Determine the volume, in cubic centimeters, of the cylinder in terms of π.

342 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*.

G.G.15: VOLUME AND LATERAL AREA

343 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

344 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.

G.G.16: VOLUME AND SURFACE AREA

345 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

346 The volume, in cubic centimeters, of a sphere whose diameter is 6 centimeters is
1 12π
2 36π
3 48π
4 288π

347 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

348 A sphere has a diameter of 18 meters. Find the volume of the sphere, in cubic meters, in terms of π.

349 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*.

350 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 p?
1 12p
2 36p
3 48p
4 288p

G.G.45: SIMILARITY

351 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.

352 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 $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$

353 $\triangle ABC$ 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?

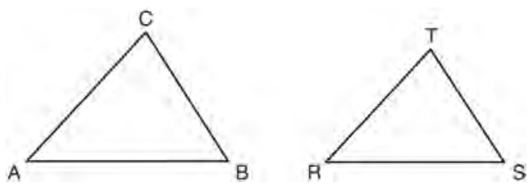
1 $\frac{m\angle A}{m\angle D}$

2 $\frac{m\angle B}{m\angle F}$

3 $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$

4 $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$

354 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 $\frac{AB + BC + AC}{RS + ST + RT} = \frac{AB}{RS}$

355 Scalene triangle *ABC* is similar to triangle *DEF*. Which statement is *false*?

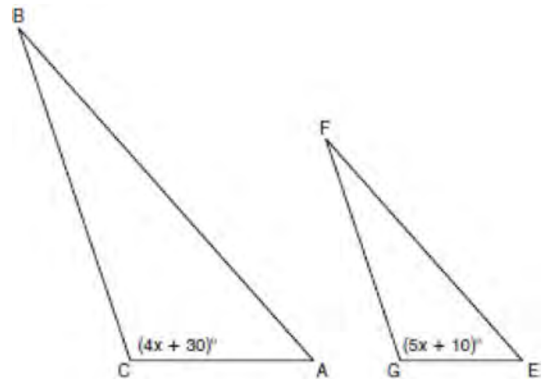
1 $AB:BC = DE:EF$

2 $AC:DF = BC:EF$

3 $\angle ACB \cong \angle DFE$

4 $\angle ABC \cong \angle EDF$

356 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*.



357 If $\triangle ABC \sim \triangle ZXY$, $m\angle A = 50$, and $m\angle C = 30$, what is $m\angle X$?

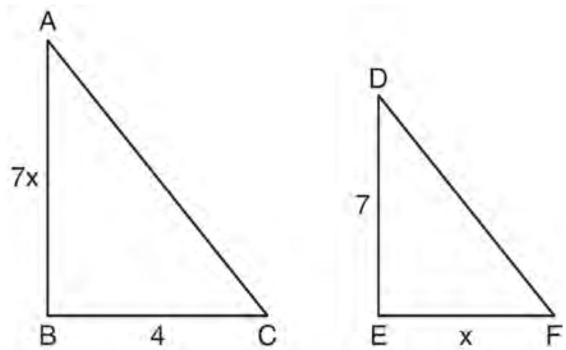
1 30

2 50

3 80

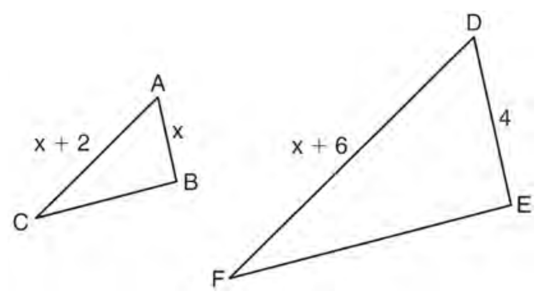
4 100

358 As shown in the diagram below, $\triangle ABC \sim \triangle DEF$, $AB = 7x$, $BC = 4$, $DE = 7$, and $EF = x$.



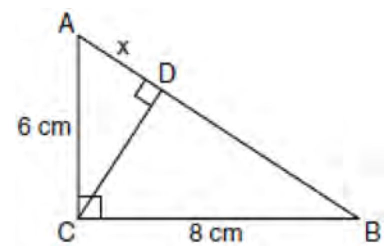
What is the length of $\overline{AB}$?
1 28
2 2
3 14
4 4

359 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.]



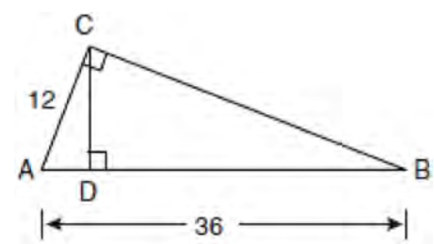
G.G.47: SIMILARITY

360 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 $\triangle ABC$.



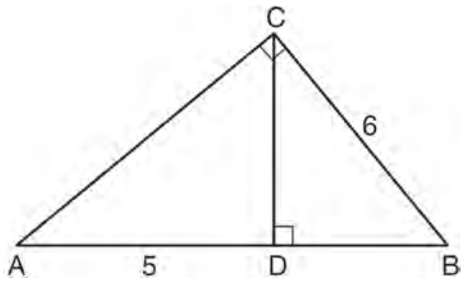
What is the length of $\overline{AD}$ to the *nearest tenth of a centimeter*?
1 3.6
2 6.0
3 6.4
4 4.0

361 In the diagram below of right triangle ACB, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



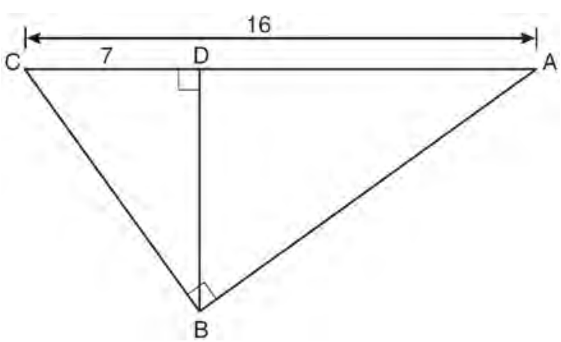
If $AB = 36$ and $AC = 12$, what is the length of $\overline{AD}$?
1 32
2 6
3 3
4 4

362 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

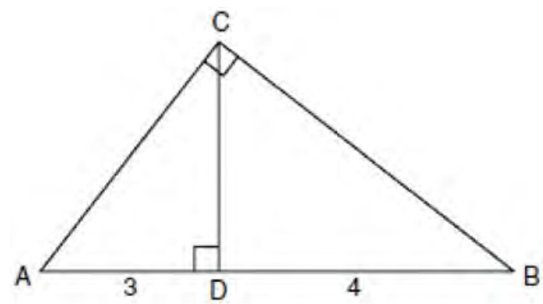
363 In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $AC = 16$, and $CD = 7$.



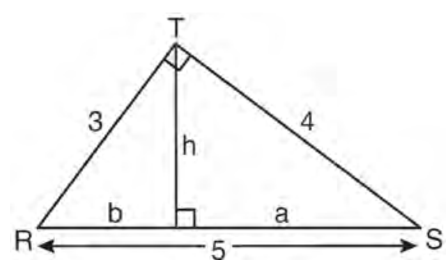
What is the length of $\overline{BD}$?
1 $3\sqrt{7}$
2 $4\sqrt{7}$
3 $7\sqrt{3}$
4 12

364 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

365 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.



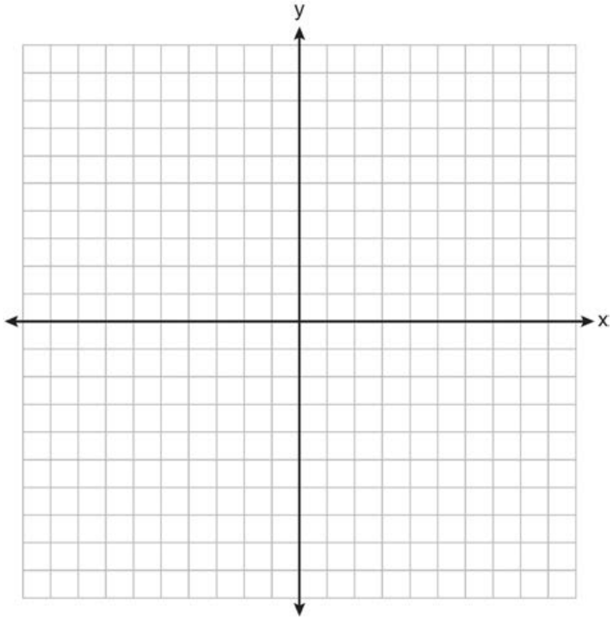
366 In the diagram below, $\triangle RST$ is a $3-4-5$ right triangle. The altitude, h, to the hypotenuse has been drawn. Determine the length of h.



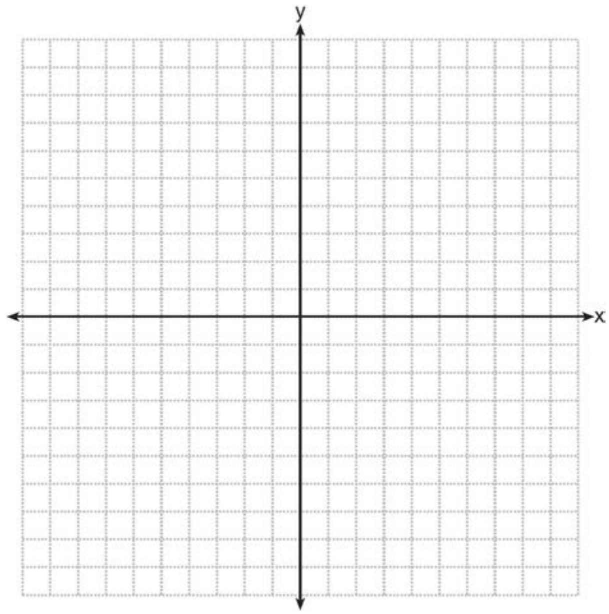
TRANSFORMATIONS

G.G.54: ROTATIONS

367 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.]



368 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.]



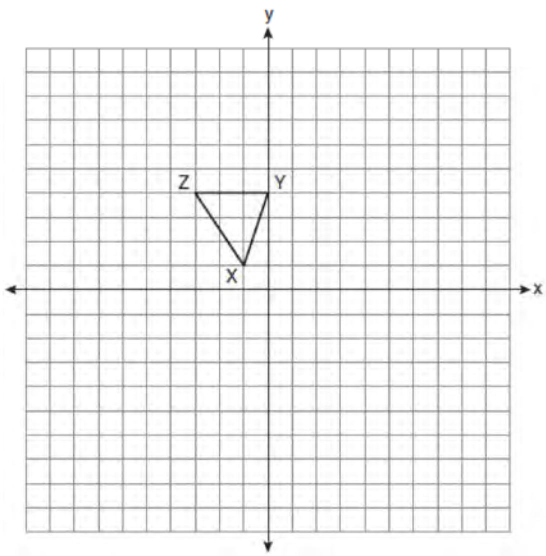
G.G.54: REFLECTIONS

369 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 $(7,-4)$

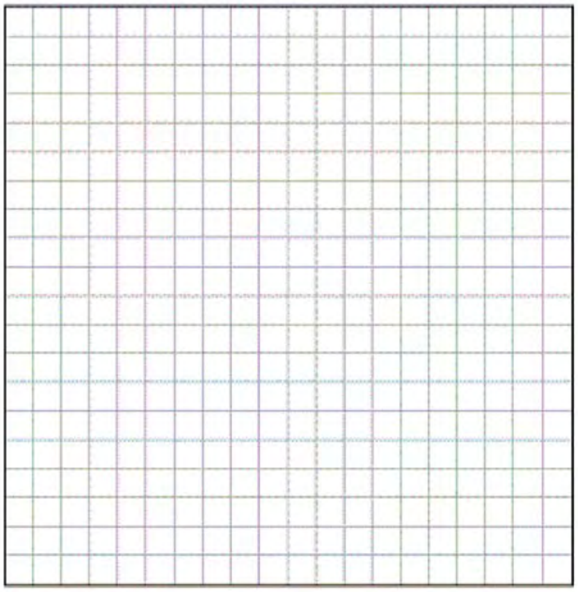
370 What is the image of the point $(2,-3)$ after the transformation $r_{y-\text{axis}}$?
1 $(2,3)$
2 $(-2,-3)$
3 $(-2,3)$
4 $(-3,2)$

371 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 $(-4b,-3a)$

372 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 $\triangle XYZ$.



373 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 $r_{\text{x-axis}}$. [The use of the grid is optional.]

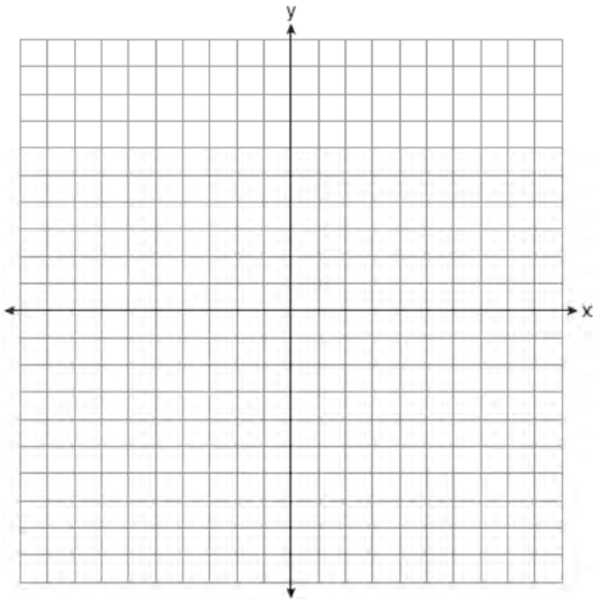


G.G.54: TRANSLATIONS

374 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 $(1,-1)$

375 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 $(-15,-8)$

376 Triangle *TAP* has coordinates $T(-1,4)$, $A(2,4)$, and $P(2,0)$. On the set of axes below, graph and label $\Delta T'A'P'$, the image of ΔTAP after the translation $(x,y) \rightarrow (x-5, y-1)$.



G.G.54: COMPOSITIONS OF TRANSFORMATIONS

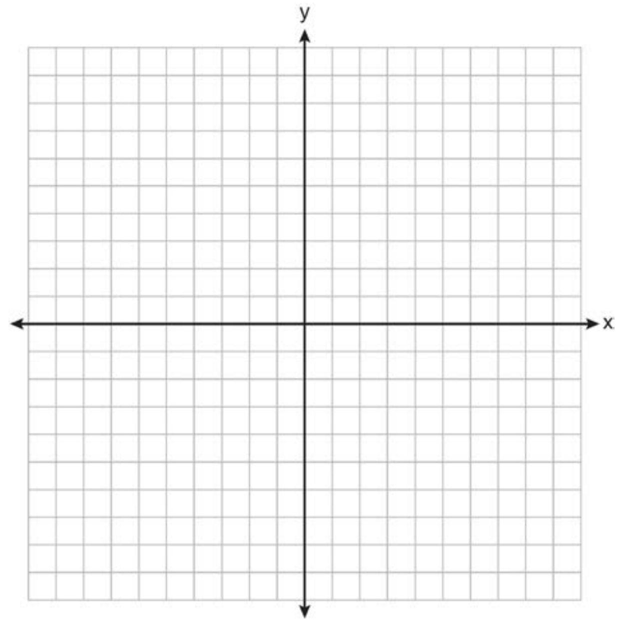
377 What is the image of point $A(4,2)$ after the composition of transformations defined by $R_{90^\circ} \circ r_{y=x}$?

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

378 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 $(-8,-12)$

379 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.]

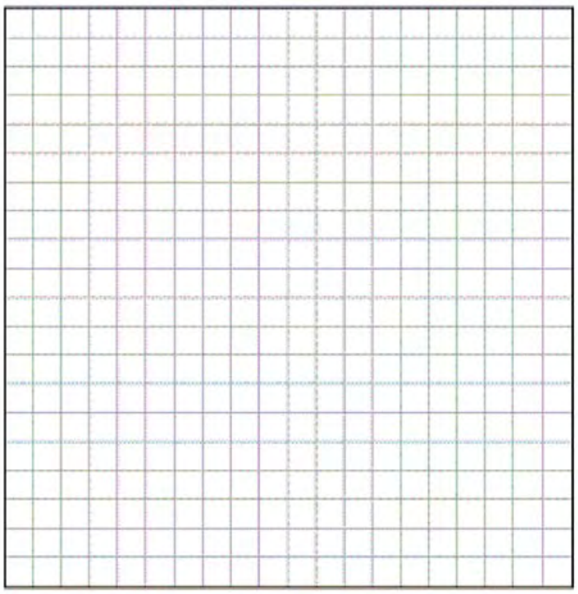


G.G.58: COMPOSITIONS OF TRANSFORMATIONS

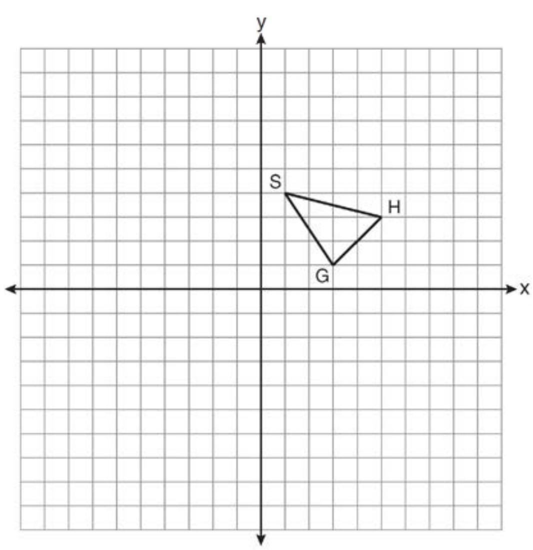
380 The endpoints of $\overline{AB}$ are $A(3,2)$ and $B(7,1)$. If $\overline{A''B''}$ is the result of the transformation of $\overline{AB}$ under $D_2 \circ T_{-4,3}$ what are the coordinates of A'' and B''?

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 $B''(22,-4)$

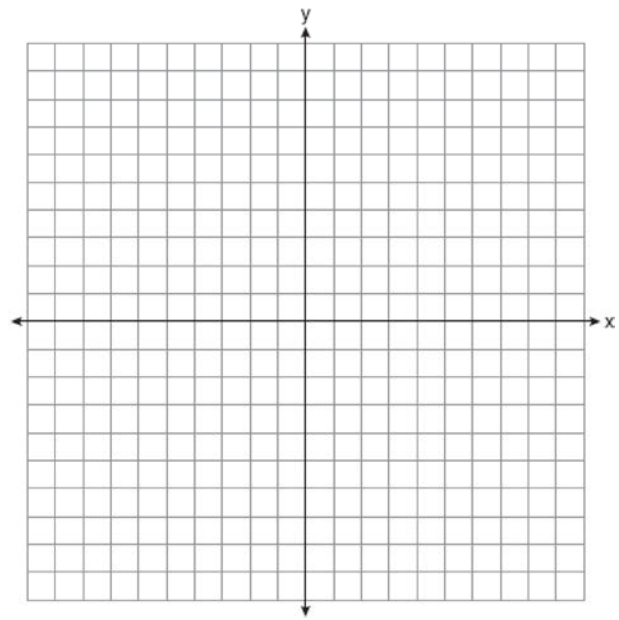
381 The coordinates of the vertices of ΔABC $A(1,3)$, $B(-2,2)$ and $C(0,-2)$. On the grid below, graph and label $\Delta A''B''C''$, the result of the composite transformation $D_2 \circ T_{3,-2}$. State the coordinates of A'', B'', and C''.



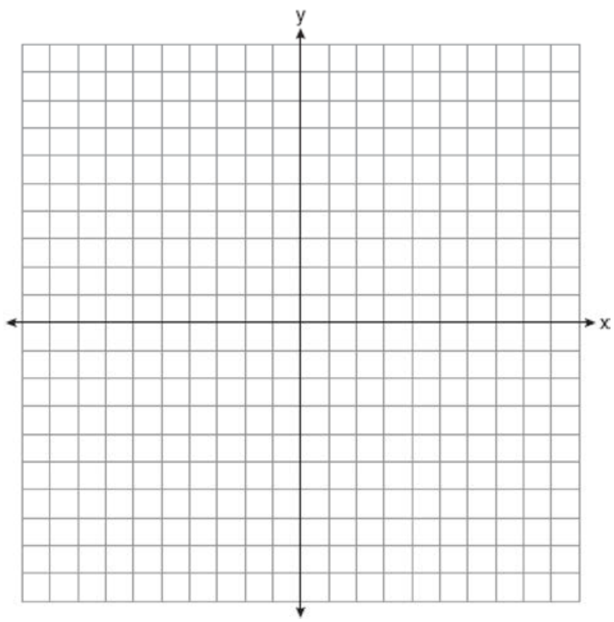
382 As shown on the set of axes below, ΔGHS has vertices $G(3,1)$, $H(5,3)$, and $S(1,4)$. Graph and state the coordinates of $\Delta G''H''S''$, the image of ΔGHS after the transformation $T_{-3,1} \circ D_2$.



383 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.]

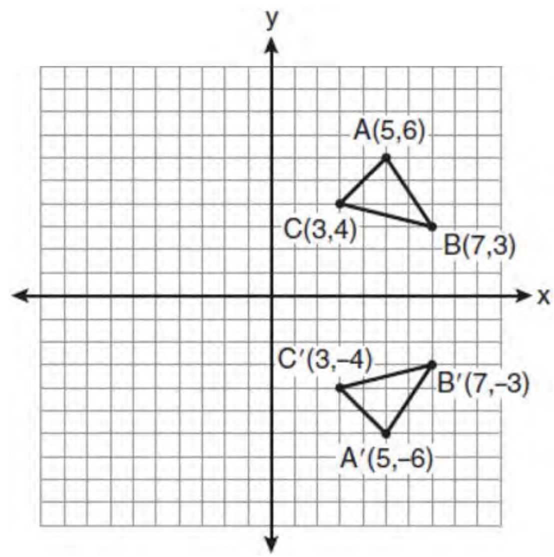


384 The vertices of ΔRST are $R(-6,5)$, $S(-7,-2)$, and $T(1,4)$. The image of ΔRST after the composition $T_{-2,3} \circ r_{y=x}$ is $\Delta R''S''T''$. State the coordinates of $\Delta R''S''T''$. [The use of the set of axes below is optional.]



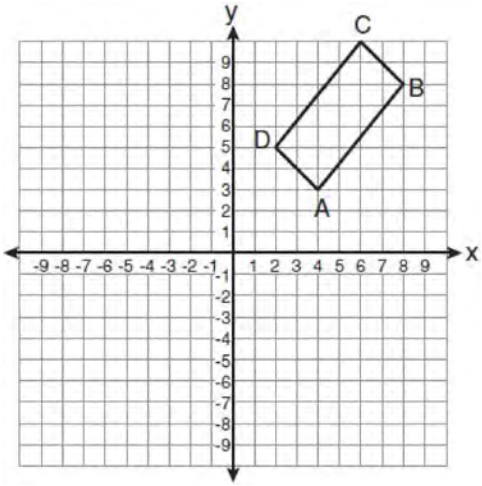
G.G.55: PROPERTIES OF TRANSFORMATIONS

385 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

386 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 $\angle A$

387 A transformation of a polygon that always preserves both length and orientation is
1 dilation
2 translation
3 line reflection
4 glide reflection

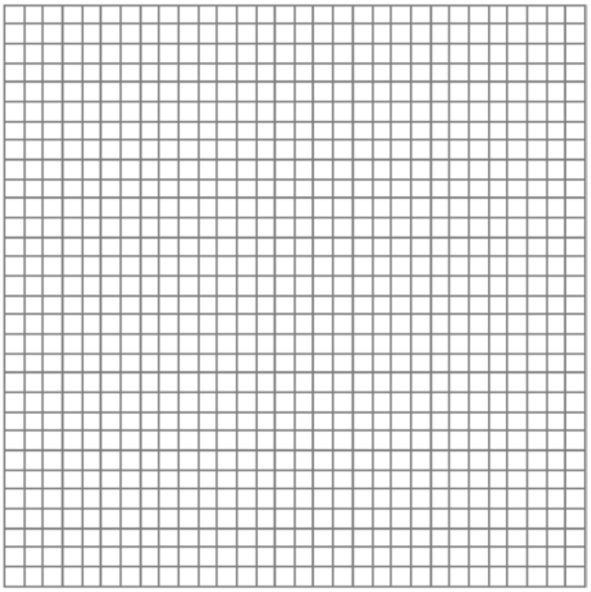
388 Quadrilateral *MNOP* is a trapezoid with $\overline{MN} \parallel \overline{OP}$. If $M'N'O'P'$ is the image of *MNOP* after a reflection over the *x*-axis, which two sides of quadrilateral $M'N'O'P'$ are parallel?
1 $\overline{M'N'}$ and $\overline{O'P'}$
2 $\overline{M'N'}$ and $\overline{N'O'}$
3 $\overline{P'M'}$ and $\overline{O'P'}$
4 $\overline{P'M'}$ and $\overline{N'O'}$

389 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 $\overline{T'P'}$

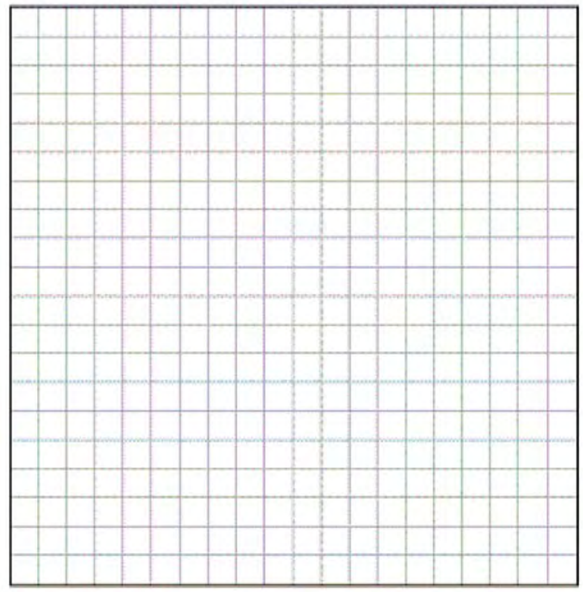
390 When a quadrilateral is reflected over the line $y = x$, which geometric relationship is *not* preserved?
1 congruence
2 orientation
3 parallelism
4 perpendicularity

391 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

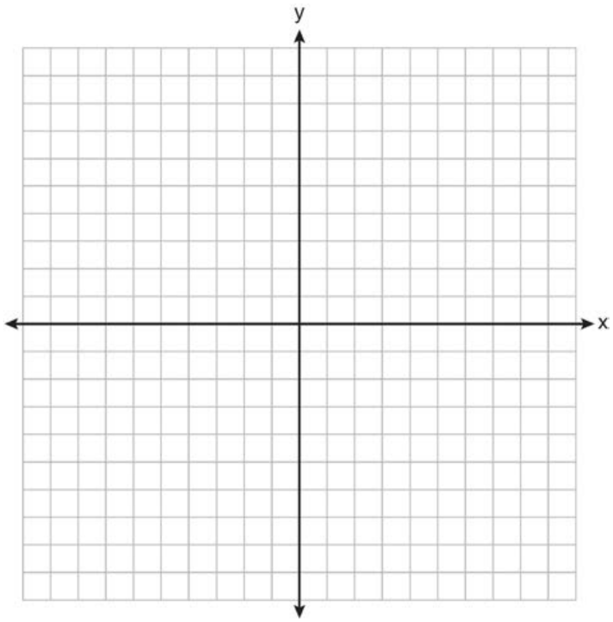
392 The vertices of $\triangle ABC$ are $A(3,2)$, $B(6,1)$, and $C(4,6)$. Identify and graph a transformation of $\triangle ABC$ such that its image, $\triangle A'B'C'$, results in $\overline{AB} \parallel \overline{A'B'}$.



393 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.



394 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.



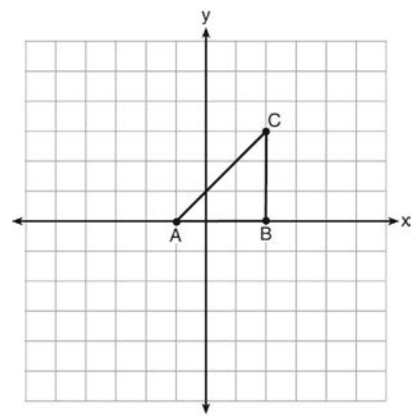
G.G.57: PROPERTIES OF TRANSFORMATIONS

395 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

396 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 $\triangle A'B'C'$

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



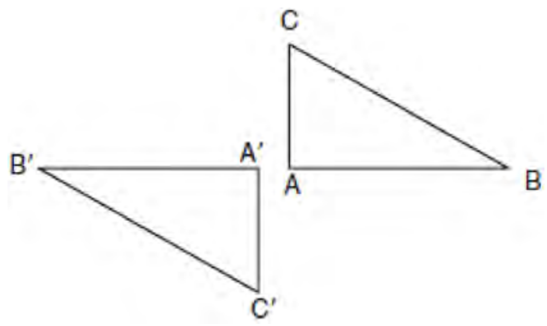
Which transformation produces an image that is similar to, but *not* congruent to, $\triangle ABC$?
1 $T_{2,3}$
2 D_2
3 $r_{y=x}$
4 R_{90}

398 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

399 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.

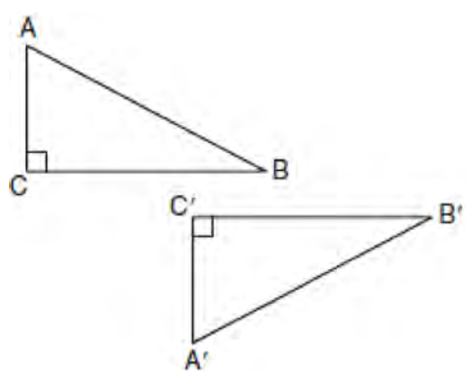
G.G.56: IDENTIFYING TRANSFORMATIONS

400 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

401 In the diagram below, which transformation was used to map $\triangle ABC$ to $\triangle A'B'C'$?

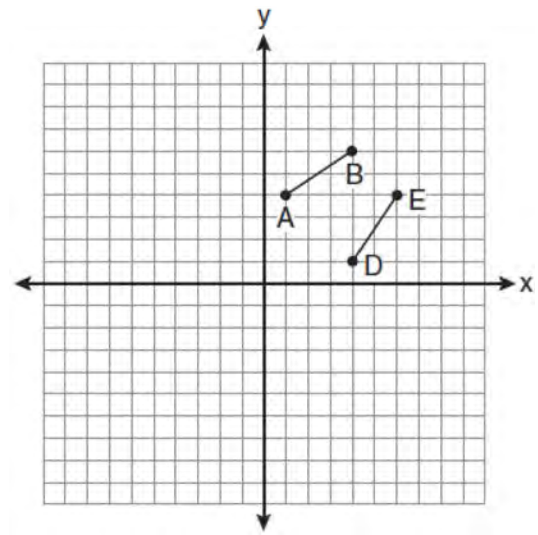


1 dilation
2 rotation
3 reflection
4 glide reflection

402 Which transformation is *not* always an isometry?
1 rotation
2 dilation
3 reflection
4 translation

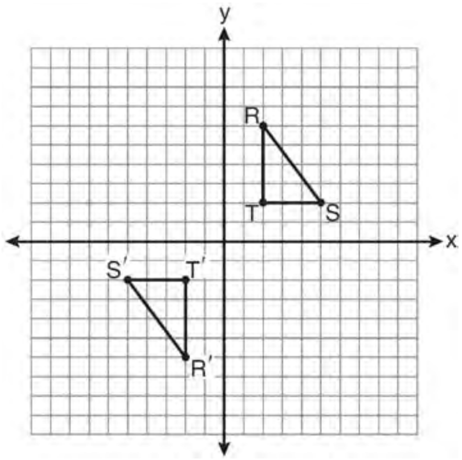
403 Which transformation can map the letter S onto itself?
1 glide reflection
2 translation
3 line reflection
4 rotation

404 The diagram below shows $\overline{AB}$ and $\overline{DE}$.



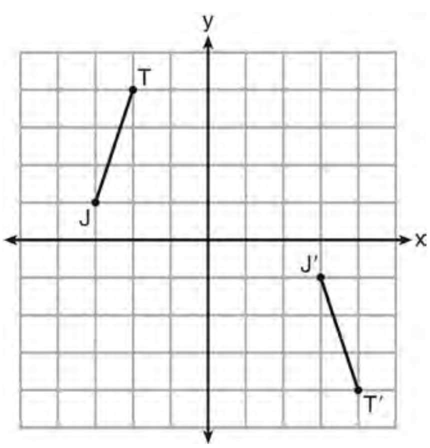
Which transformation will move $\overline{AB}$ onto $\overline{DE}$ such that point D is the image of point A and point E is the image of point B?
1 $T_{3,-3}$
2 $D_{\frac{1}{2}}$
3 R_{90°
4 $r_{y=x}$

405 As shown on the graph below, $\Delta R'S'T'$ is the image of ΔRST under a single transformation.



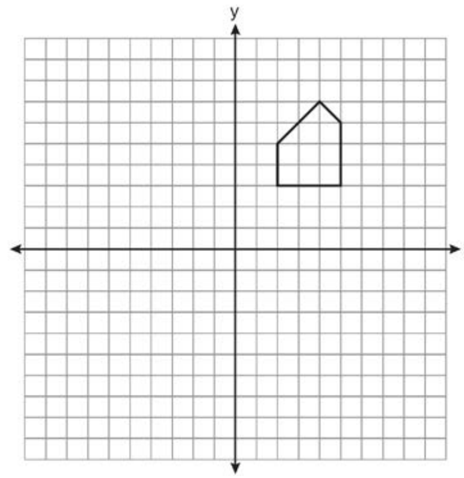
Which transformation does this graph represent?
1 glide reflection
2 line reflection
3 rotation
4 translation

406 The graph below shows $\overline{JT}$ and its image, $\overline{J'T'}$, after a transformation.



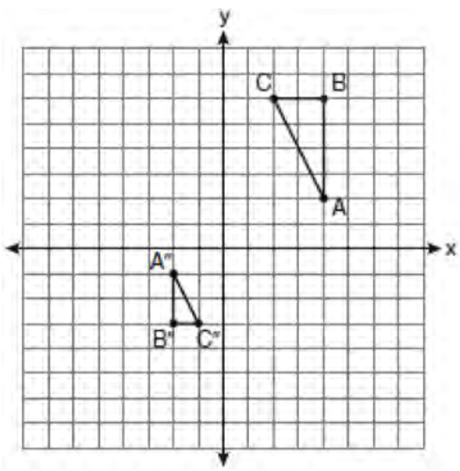
Which transformation would map $\overline{JT}$ onto $\overline{J'T'}$?
1 translation
2 glide reflection
3 rotation centered at the origin
4 reflection through the origin

407 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.]



G.G.60: IDENTIFYING TRANSFORMATIONS

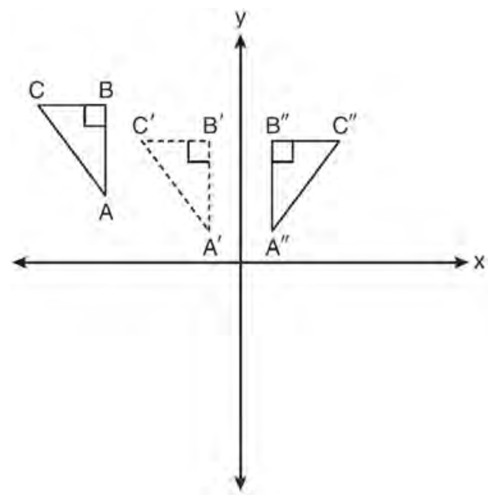
408 After a composition of transformations, the coordinates $A(4,2)$, $B(4,6)$, and $C(2,6)$ become $A''(-2,-1)$, $B''(-2,-3)$, and $C''(-1,-3)$, as shown on the set of axes below.



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 $D_{\frac{1}{2}} \circ R_{90^\circ}$

409 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 $r_{y=x}$

410 In the diagram below, $\triangle A'B'C'$ is a transformation of $\triangle ABC$, and $\triangle A''B''C''$ is a transformation of $\triangle A'B'C'$.

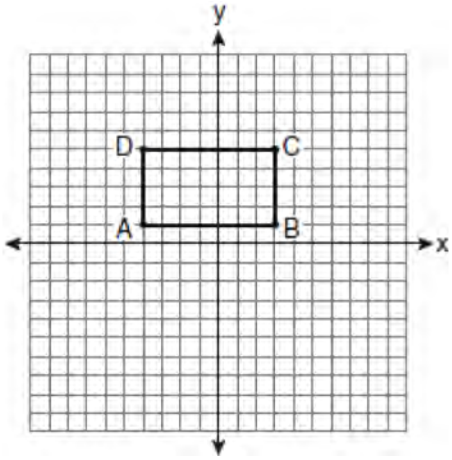


The composite transformation of $\triangle ABC$ to $\triangle A''B''C''$ is an example of a
1 reflection followed by a rotation
2 reflection followed by a translation
3 translation followed by a rotation
4 translation followed by a reflection

G.G.61: ANALYTICAL REPRESENTATIONS OF TRANSFORMATIONS

411 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

412 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.

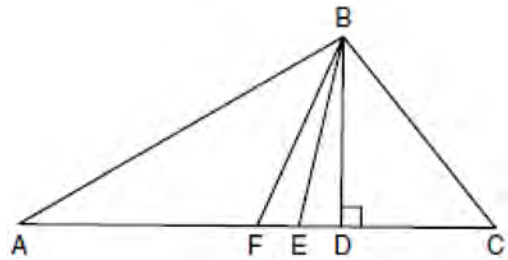


What will be the area of the rectangle after these transformations?
1 exactly 28 square units
2 less than 28 square units
3 greater than 28 square units
4 It cannot be determined from the information given.

LOGIC

G.G.24: STATEMENTS AND NEGATIONS

413 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 $\overline{CF} \cong \overline{FA}$

414 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.

415 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.

416 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.

417 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

418 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

419 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.

420 Write the negation of the statement “2 is a prime number,” and determine the truth value of the negation.

G.G.25: COMPOUND STATEMENTS

421 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.

422 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

423 Given: Two is an even integer or three is an even integer.
Determine the truth value of this disjunction.
Justify your answer.

G.G.26: CONDITIONAL STATEMENTS

424 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.

425 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.

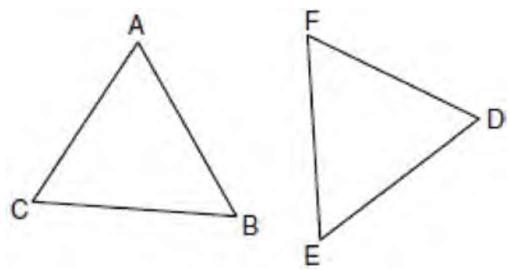
426 What is the contrapositive of the statement, “If I am tall, then I will bump my head”?
1 If I bump my head, then I am tall.
2 If I do not bump my head, then I am tall.
3 If I am tall, then I will not bump my head.
4 If I do not bump my head, then I am not tall.

427 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.

428 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.

G.G.28: TRIANGLE CONGRUENCY

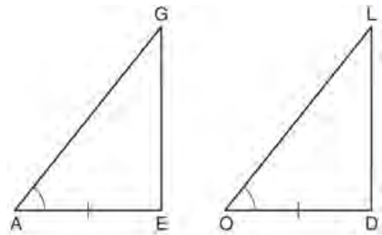
429 In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\angle B \cong \angle E$.



Which method can be used to prove $\triangle ABC \cong \triangle DEF$?
1 SSS
2 SAS
3 ASA
4 HL

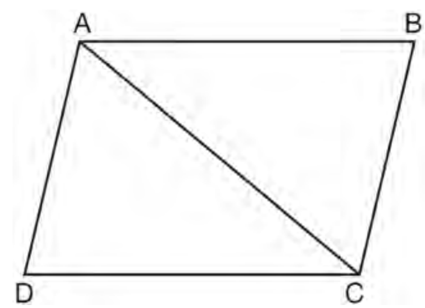
430 The diagonal $\overline{AC}$ is drawn in parallelogram $ABCD$. Which method can *not* be used to prove that $\triangle ABC \cong \triangle CDA$?
1 SSS
2 SAS
3 SSA
4 ASA

431 In the diagram below of $\triangle AGE$ and $\triangle OLD$, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.



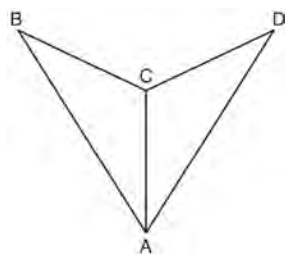
To prove that $\triangle AGE$ and $\triangle OLD$ are congruent by SAS, what other information is needed?
1 $\overline{GE} \cong \overline{LD}$
2 $\overline{AG} \cong \overline{OL}$
3 $\angle AGE \cong \angle OLD$
4 $\angle AEG \cong \angle ODL$

432 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

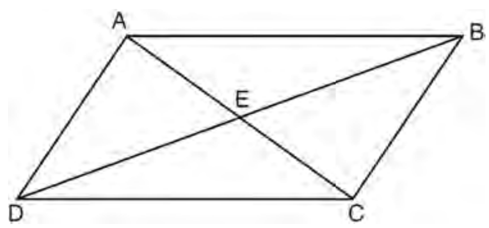
433 As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.



Which method could be used to prove $\triangle ABC \cong \triangle ADC$?

1 SSS
2 AAA
3 SAS
4 AAS

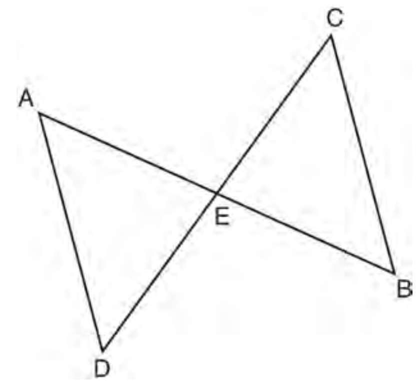
434 In parallelogram *ABCD* shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*.



Which statement must be true?

1 $\overline{AC} \cong \overline{DB}$
2 $\angle ABD \cong \angle CBD$
3 $\triangle AED \cong \triangle CEB$
4 $\triangle DCE \cong \triangle BCE$

435 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 $\angle BCE \cong \angle DAE$.

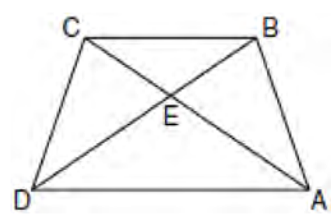


Triangle *DAE* can be proved congruent to triangle *BCE* by

1 ASA
2 SAS
3 SSS
4 HL

G.G.29: TRIANGLE CONGRUENCY

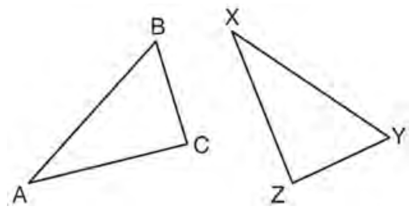
436 In the diagram of trapezoid *ABCD* below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E* and $\triangle ABC \cong \triangle DCB$.



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 $\angle CDB \cong \angle BAC$

437 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



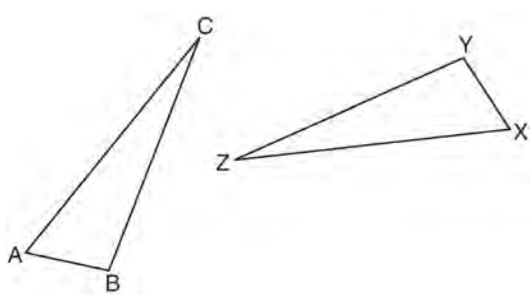
Which two statements identify corresponding congruent parts for these triangles?

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 $\angle A \cong \angle X$

438 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 $\overline{JK} \cong \overline{ON}$

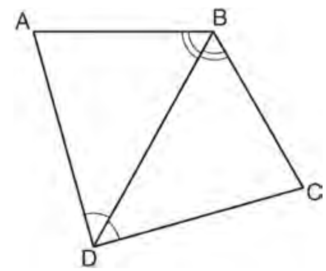
439 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which statement must be true?

1 $\angle C \cong \angle Y$
2 $\angle A \cong \angle X$
3 $\overline{AC} \cong \overline{YZ}$
4 $\overline{CB} \cong \overline{XZ}$

440 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 $\overline{AD} \cong \overline{CD}$

G.G.27: LINE PROOFS

441 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 $AB + CD = AD$

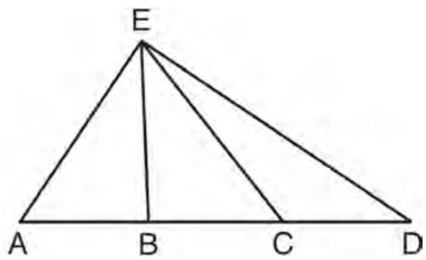
G.G.27: ANGLE PROOFS

442 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

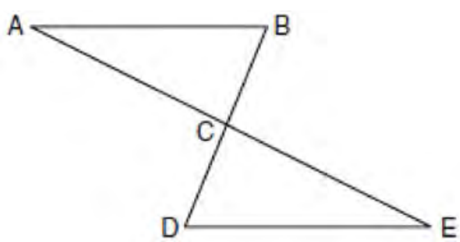
443 In $\triangle AED$ with $\overline{ABCD}$ shown in the diagram below, $\overline{EB}$ and $\overline{EC}$ are drawn.



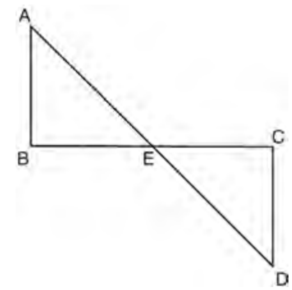
If $\overline{AB} \cong \overline{CD}$, which statement could always be proven?

1 $\overline{AC} \cong \overline{DB}$
2 $\overline{AE} \cong \overline{ED}$
3 $\overline{AB} \cong \overline{BC}$
4 $\overline{EC} \cong \overline{EA}$

444 Given: $\triangle ABC$ and $\triangle EDC$, C is the midpoint of $\overline{BD}$ and $\overline{AE}$
Prove: $\overline{AB} \parallel \overline{DE}$

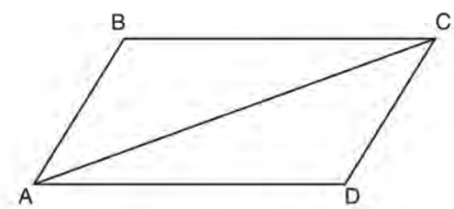


445 Given: $\overline{AD}$ bisects $\overline{BC}$ at E.
$\overline{AB} \perp \overline{BC}$
$\overline{DC} \perp \overline{BC}$
Prove: $\overline{AB} \cong \overline{DC}$



G.G.27: QUADRILATERAL PROOFS

446 Given that *ABCD* is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.

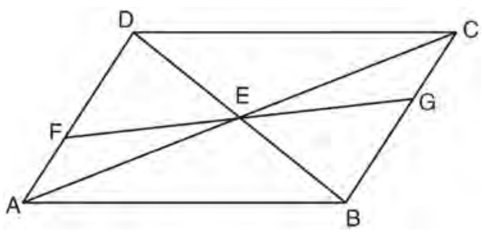


Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$ $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side
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.

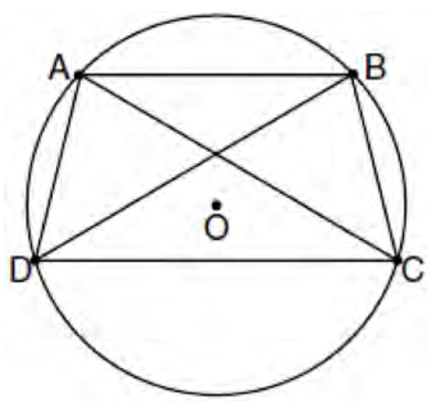
447 In the diagram below of quadrilateral $ABCD$, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$. Line segments AC, DB, and FG intersect at E.
Prove: $\triangle AEF \cong \triangle CEG$



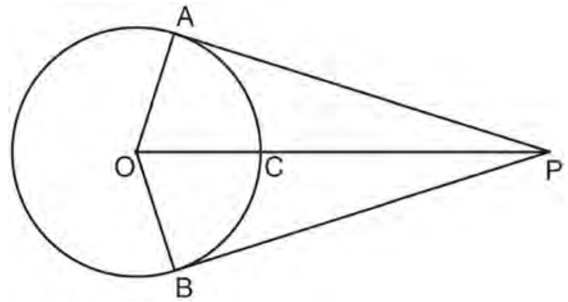
448 Given: Quadrilateral $ABCD$ with $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{BC}$, and diagonal $\overline{BD}$ is drawn
Prove: $\angle BDC \cong \angle ABD$

G.G.27: CIRCLE PROOFS

449 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 $\triangle ACD \cong \triangle BDC$.

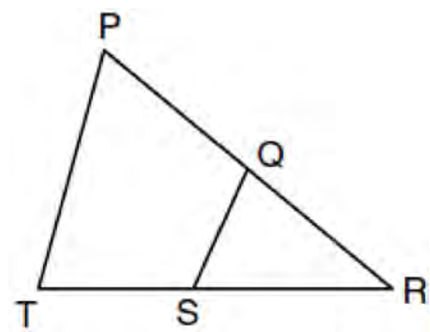


450 In the diagram below, $\overline{PA}$ and $\overline{PB}$ are tangent to circle O, $\overline{OA}$ and $\overline{OB}$ are radii, and $\overline{OP}$ intersects the circle at C. Prove: $\angle AOP \cong \angle BOP$



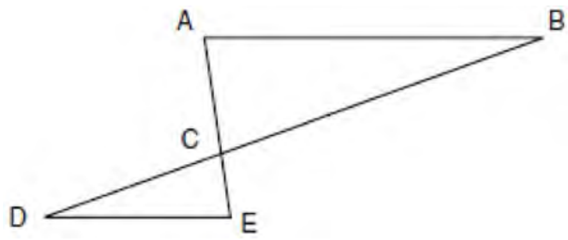
G.G.44: SIMILARITY PROOFS

451 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

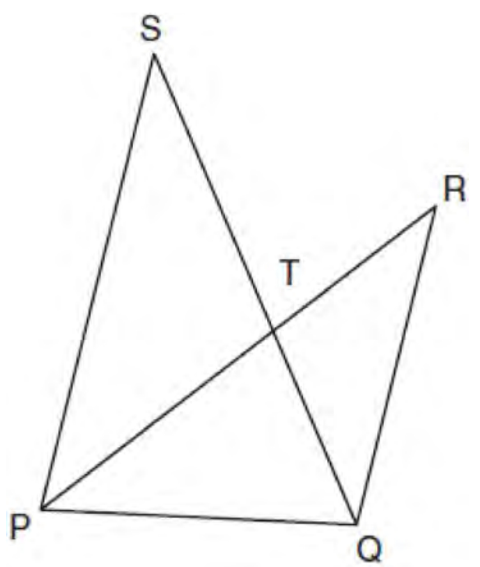
452 In the diagram of ΔABC and ΔEDC below, $\overline{AE}$ and $\overline{BD}$ intersect at C, and $\angle CAB \cong \angle CED$.



Which method can be used to show that ΔABC must be similar to ΔEDC?

1 SAS
2 AA
3 SSS
4 HL

453 In the diagram below, $\overline{SQ}$ and $\overline{PR}$ intersect at T, $\overline{PQ}$ is drawn, and $\overline{PS} \parallel \overline{QR}$.



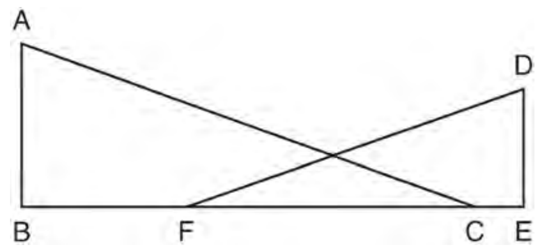
What technique can be used to prove that $\Delta PST \sim \Delta RQT$?

1 SAS
2 SSS
3 ASA
4 AA

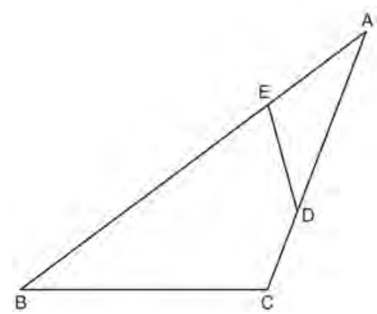
454 In ΔABC and ΔDEF, $\frac{AC}{DF} = \frac{CB}{FE}$. Which additional information would prove $\Delta ABC \sim \Delta DEF$?

1 $AC = DF$
2 $CB = FE$
3 $\angle ACB \cong \angle DFE$
4 $\angle BAC \cong \angle EDF$

455 In the diagram below, $\overline{BFCE}$, $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$, and $\angle BFD \cong \angle ECA$. Prove that $\Delta ABC \sim \Delta DEF$.



456 The diagram below shows ΔABC, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. Prove that ΔABC is similar to ΔADE.



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: 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

7 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

8 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

9 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

10 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

11 ANS: 4

$3y + 1 = 6x + 4$. $2y + 1 = x - 9$

$3y = 6x + 3$ $\quad 2y = x - 10$

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

PTS: 2 REF: fall0822ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

12 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

13 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

14 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

15 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

16 ANS: 2

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

PTS: 2 REF: 081014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

17 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

18 ANS: 1 PTS: 2 REF: 061113ge STA: G.G.63
TOP: Parallel and Perpendicular Lines

19 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

20 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

21 ANS: 2

The slope of $y=\frac{1}{2}x+5$ is $\frac{1}{2}$. The slope of a perpendicular line is −2.
$$y=mx+b \quad .$$
$$5=(-2)(-2)+b$$
$$b=1$$

PTS: 2 REF: 060907ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

22 ANS: 4

The slope of $y = -3x + 2$ is -3. The perpendicular slope is $\frac{1}{3}$.

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

PTS: 2 REF: 011018ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

23 ANS: 3 PTS: 2 REF: 011217ge STA: G.G.64
TOP: Parallel and Perpendicular Lines

24 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

25 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

26 ANS:

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

$$2y + 3x = 6$$
$$2y = -3x + 6$$
$$y = -\frac{3}{2}x + 3$$
$$m = -\frac{3}{2}$$
$$m_{\perp} = \frac{2}{3}$$

.

$$y = mx + b$$
$$5 = \frac{2}{3}(6) + b$$
$$5 = 4 + b$$
$$1 = b$$
$$y = \frac{2}{3}x + 1$$

PTS: 4 REF: 061036ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

27 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

28 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:

$$y = mx + b$$
$$3 = -2(7) + b$$
$$17 = b$$

PTS: 2 REF: 081010ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

29 ANS: 4

$$y = mx + b$$
$$3 = \frac{3}{2}(-2) + b$$
$$3 = -3 + b$$
$$6 = b$$

PTS: 2 REF: 011114ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

30 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.

$$y - 2 = -\frac{4}{3}(x + 5)$$
$$3y - 6 = -4x - 20$$
$$4x + 3y = -14$$

PTS: 2 REF: 061123ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

31 ANS: 2

$$m = \frac{-A}{B} = \frac{-4}{2} = -2 \qquad y = mx + b$$
$$2 = -2(2) + b$$
$$6 = b$$

PTS: 2 REF: 081112ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

32 ANS: 3

$$y = mx + b$$
$$-1 = 2(2) + b$$
$$-5 = b$$

PTS: 2 REF: 011224ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

33 ANS: 4

$m = \frac{-A}{B} = \frac{-3}{2}$. $y = mx + b$

$$-1 = \left(\frac{-3}{2}\right)(2) + b$$

$$-1 = -3 + b$$

$$2 = b$$

PTS: 2 REF: 061226ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

34 ANS: 1

$m = \frac{3}{2}$ $y = mx + b$

$$2 = \frac{3}{2}(1) + b$$

$$\frac{1}{2} = b$$

PTS: 2 REF: 081217ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

35 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

36 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

37 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

38 ANS: 1

$m = \left(\frac{8+0}{2}, \frac{2+6}{2}\right) = (4,4)$ $m = \frac{6-2}{0-8} = \frac{4}{-8} = -\frac{1}{2}$ $m_{\perp} = 2$ $y = mx + b$

$$4 = 2(4) + b$$

$$-4 = b$$

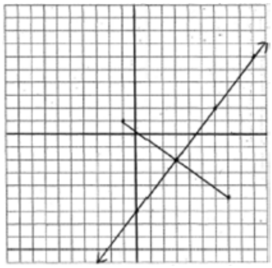
PTS: 2 REF: 081126ge STA: G.G.68 TOP: Perpendicular Bisector

39 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 $\frac{4}{3}$.

$M_y = \frac{1+(-5)}{2} = -2$

$m = \frac{1-(-5)}{-1-7} = -\frac{3}{4}$

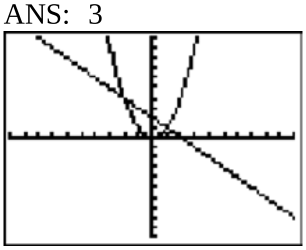


$y - y_M = m(x - x_M)$.

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

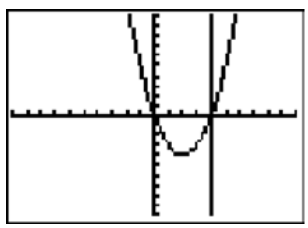
PTS: 4 REF: 080935ge STA: G.G.68 TOP: Perpendicular Bisector

40 ANS: 3



PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

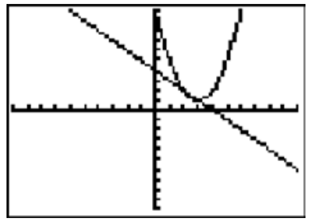
41 ANS: 1



$y = x^2 - 4x = (4)^2 - 4(4) = 0$. $(4, 0)$ is the only intersection.

PTS: 2 REF: 060923ge STA: G.G.70 TOP: Quadratic-Linear Systems

42 ANS: 4



$y + x = 4$. $x^2 - 6x + 10 = -x + 4$. $y + x = 4$. $y + 2 = 4$

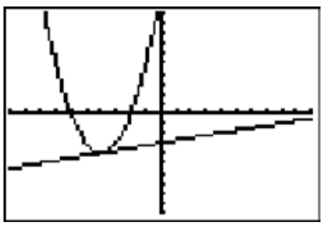
$y = -x + 4$ $\quad x^2 - 5x + 6 = 0$ $\quad y + 3 = 4$ $\quad y = 2$

$(x - 3)(x - 2) = 0$ $\quad y = 1$

$x = 3 \text{ or } 2$

PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

43 ANS: 3



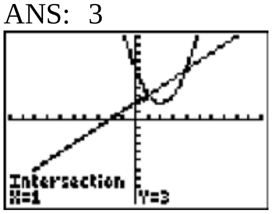
PTS: 2 REF: 061011ge STA: G.G.70 TOP: Quadratic-Linear Systems

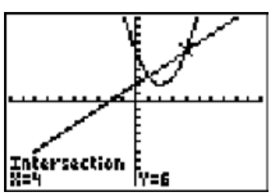
44 ANS: 3

$$(x + 3)^2 - 4 = 2x + 5$$
$$x^2 + 6x + 9 - 4 = 2x + 5$$
$$x^2 + 4x = 0$$
$$x(x + 4) = 0$$
$$x = 0, -4$$

PTS: 2 REF: 081004ge STA: G.G.70 TOP: Quadratic-Linear Systems

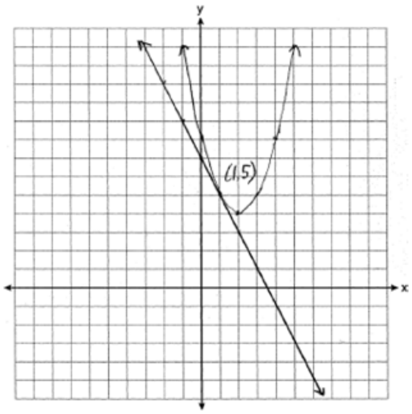
45 ANS: 3

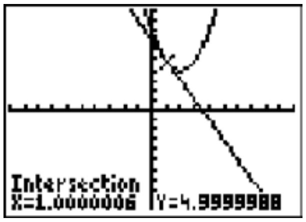




PTS: 2 REF: 081118ge STA: G.G.70 TOP: Quadratic-Linear Systems

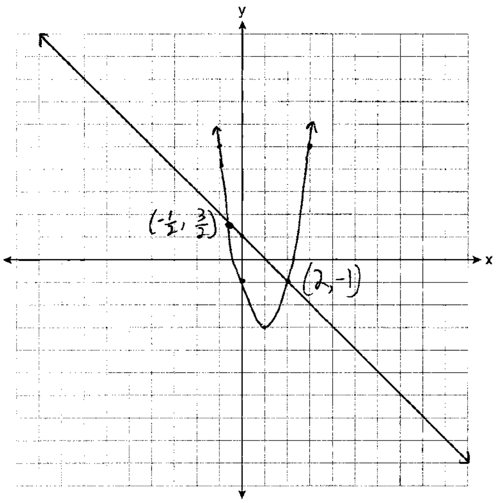
46 ANS:





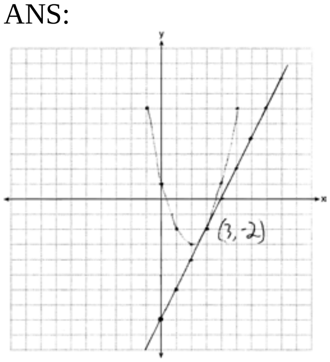
PTS: 6 REF: 011038ge STA: G.G.70 TOP: Quadratic-Linear Systems

47 ANS:



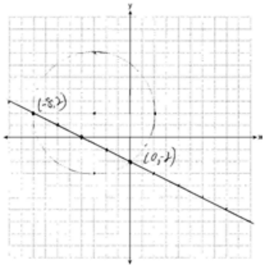
PTS: 4 REF: 061137ge STA: G.G.70 TOP: Quadratic-Linear Systems

48 ANS:



PTS: 6 REF: 061238ge STA: G.G.70 TOP: Quadratic-Linear Systems

49 ANS:



PTS: 4 REF: 081237ge STA: G.G.70 TOP: Quadratic-Linear Systems

50 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

51 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

52 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

53 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

54 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

55 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

56 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

57 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

58 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

59 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

60 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

61 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

62 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

63 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

64 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

65 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

66 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

67 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

68 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

69 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

70 ANS: 3 PTS: 2 REF: fall0816ge STA: G.G.1
TOP: Planes

71 ANS: 4 PTS: 2 REF: 011012ge STA: G.G.1
TOP: Planes

72 ANS: 3 PTS: 2 REF: 061017ge STA: G.G.1
TOP: Planes
73 ANS: 4 PTS: 2 REF: 061118ge STA: G.G.1
TOP: Planes
74 ANS: 3 PTS: 2 REF: 081218ge STA: G.G.1
TOP: Planes
75 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes
76 ANS: 1 PTS: 2 REF: 011128ge STA: G.G.2
TOP: Planes
77 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes
78 ANS: 1 PTS: 2 REF: 081008ge STA: G.G.3
TOP: Planes
79 ANS: 1 PTS: 2 REF: 011218ge STA: G.G.3
TOP: Planes
80 ANS: 2 PTS: 2 REF: 080927ge STA: G.G.4
TOP: Planes
81 ANS: 4 PTS: 2 REF: 061213ge STA: G.G.5
TOP: Planes
82 ANS: 4 PTS: 2 REF: 081211ge STA: G.G.5
TOP: Planes
83 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes
84 ANS: 1 PTS: 2 REF: 081116ge STA: G.G.7
TOP: Planes
85 ANS: 3 PTS: 2 REF: 060928ge STA: G.G.8
TOP: Planes
86 ANS: 2 PTS: 2 REF: 081120ge STA: G.G.8
TOP: Planes
87 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes
88 ANS: 3 PTS: 2 REF: 081002ge STA: G.G.9
TOP: Planes
89 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes
90 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes
91 ANS: 4 PTS: 2 REF: 061203ge STA: G.G.9
TOP: Planes
92 ANS: 3
The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids
93 ANS: 4 PTS: 2 REF: 061003ge STA: G.G.10
TOP: Solids

94 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids

95 ANS: 1 PTS: 2 REF: 011221ge STA: G.G.10
TOP: Solids

96 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids

97 ANS: 3 PTS: 2 REF: 060925ge STA: G.G.17
TOP: Constructions

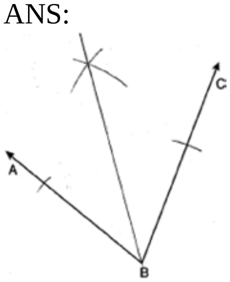
98 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17
TOP: Constructions

99 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17
TOP: Constructions

100 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions

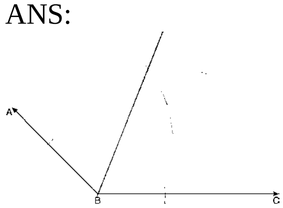
101 ANS: 2 PTS: 2 REF: 081205ge STA: G.G.17
TOP: Constructions

102 ANS:



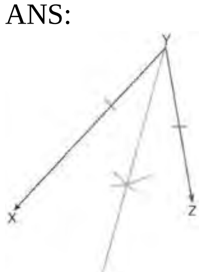
PTS: 2 REF: 080932ge STA: G.G.17 TOP: Constructions

103 ANS:



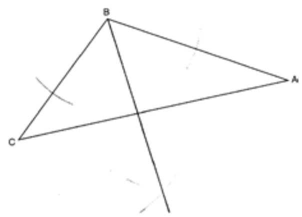
PTS: 2 REF: 011133ge STA: G.G.17 TOP: Constructions

104 ANS:



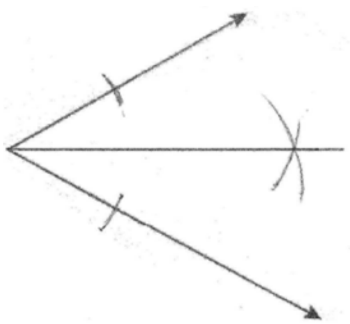
PTS: 2 REF: 011233ge STA: G.G.17 TOP: Constructions

105 ANS:



PTS: 2 REF: 061232ge STA: G.G.17 TOP: Constructions

106 ANS:



PTS: 2 REF: fall0832ge STA: G.G.17 TOP: Constructions

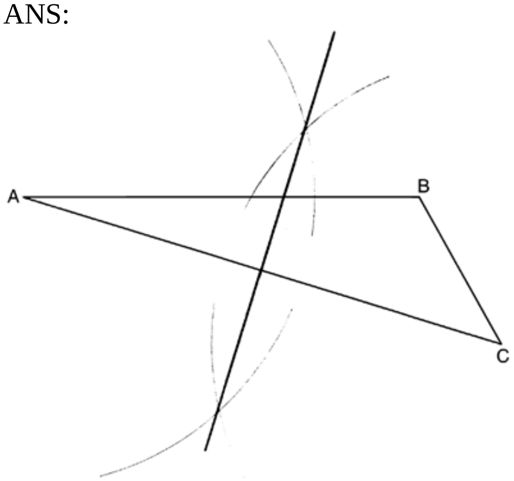
107 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions

108 ANS: 4 PTS: 2 REF: 081005ge STA: G.G.18
TOP: Constructions

109 ANS: 1 PTS: 2 REF: 011120ge STA: G.G.18
TOP: Constructions

110 ANS: 2 PTS: 2 REF: 061101ge STA: G.G.18
TOP: Constructions

111 ANS:



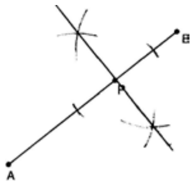
PTS: 2 REF: 081130ge STA: G.G.18 TOP: Constructions

112 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions

113 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19
TOP: Constructions

114 ANS: 2 PTS: 2 REF: 061020ge STA: G.G.19
TOP: Constructions

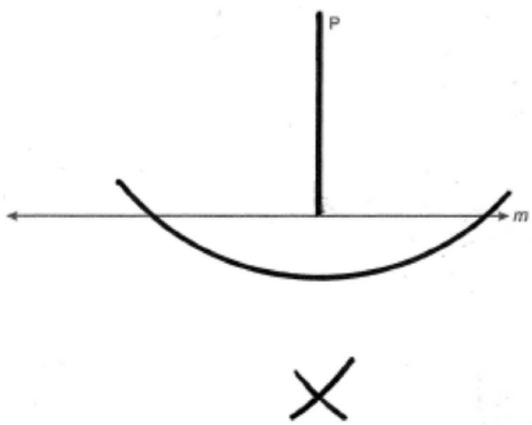
115 ANS:



PTS: 2 REF: 081233ge STA: G.G.19 TOP: Constructions

116 ANS: 2 PTS: 2 REF: 061208ge STA: G.G.19
TOP: Constructions

117 ANS:

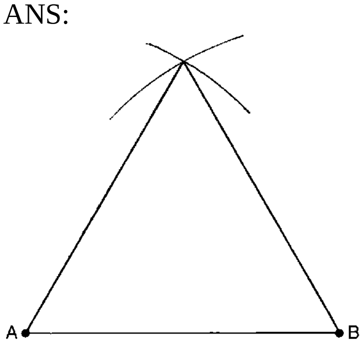


PTS: 2 REF: 060930ge STA: G.G.19 TOP: Constructions

118 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions

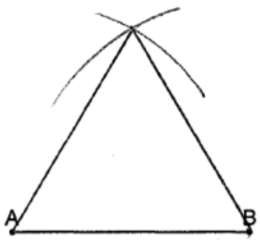
119 ANS: 1 PTS: 2 REF: 011207ge STA: G.G.20
TOP: Constructions

120 ANS:



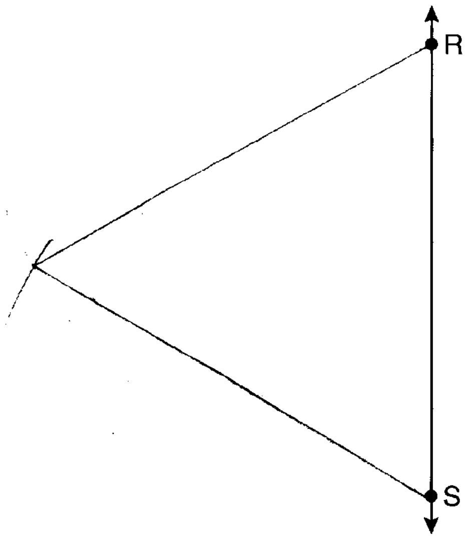
PTS: 2 REF: 081032ge STA: G.G.20 TOP: Constructions

121 ANS:



PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions

122 ANS:

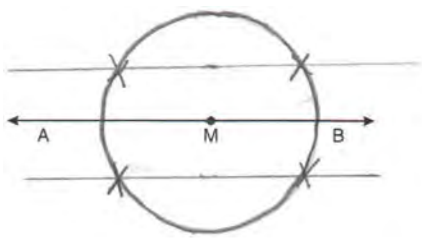


PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

123 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

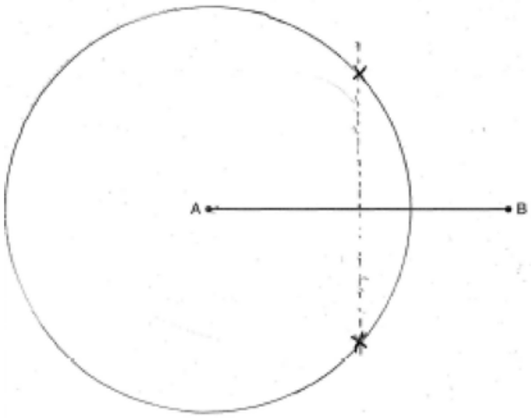
124 ANS: 2 PTS: 2 REF: 061121ge STA: G.G.22
TOP: Locus

125 ANS:



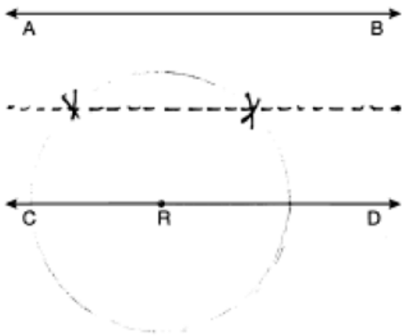
PTS: 2 REF: 011230ge STA: G.G.22 TOP: Locus

126 ANS:



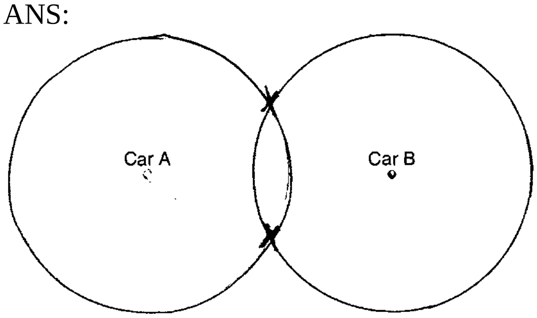
PTS: 2 REF: 060932ge STA: G.G.22 TOP: Locus

127 ANS:



PTS: 2 REF: 061033ge STA: G.G.22 TOP: Locus

128 ANS:

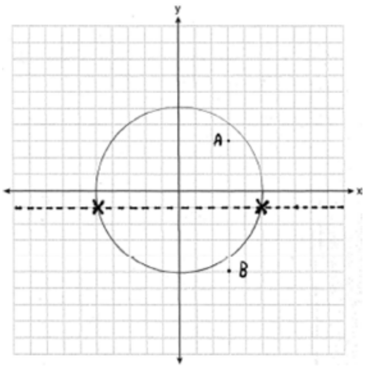


PTS: 2 REF: 081033ge STA: G.G.22 TOP: Locus

129 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

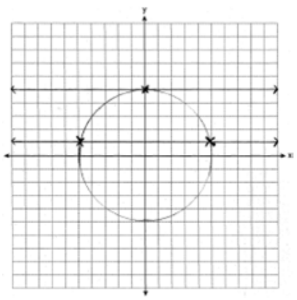
130 ANS: 2 PTS: 2 REF: 081117ge STA: G.G.23
TOP: Locus

131 ANS:



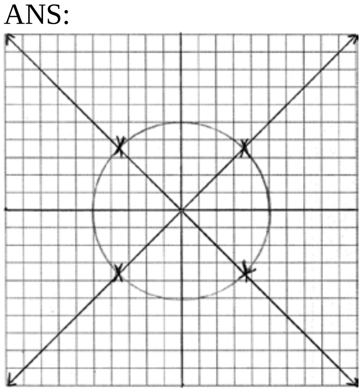
PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

132 ANS:



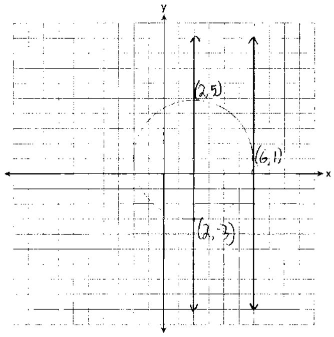
PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

133 ANS:



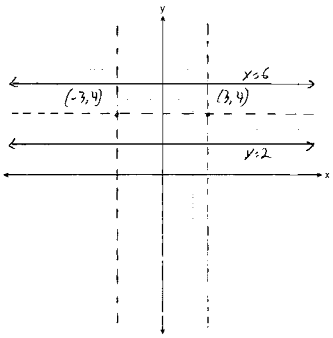
PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

134 ANS:



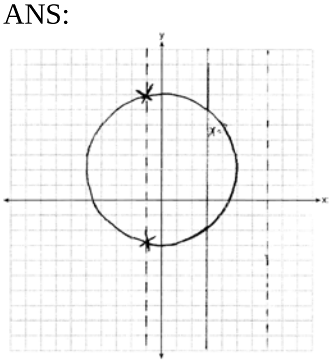
PTS: 4 REF: 011135ge STA: G.G.23 TOP: Locus

135 ANS:



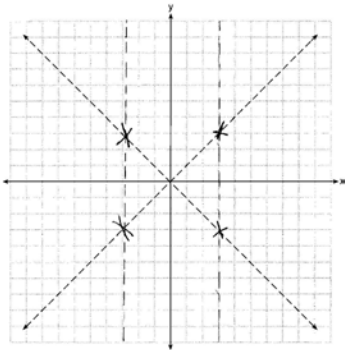
PTS: 4 REF: 061135ge STA: G.G.23 TOP: Locus

136 ANS:



PTS: 2 REF: 061234ge STA: G.G.23 TOP: Locus

137 ANS:



PTS: 2 REF: 081234ge STA: G.G.23 TOP: Locus

138 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

139 ANS: 2 PTS: 2 REF: 061007ge STA: G.G.35
TOP: Parallel Lines and Transversals

140 ANS: 2

$$7x = 5x + 30$$
$$2x = 30$$
$$x = 15$$

PTS: 2 REF: 061106ge STA: G.G.35 TOP: Parallel Lines and Transversals

141 ANS: 3

$$7x = 5x + 30$$
$$2x = 30$$
$$x = 15$$

PTS: 2 REF: 081109ge STA: G.G.35 TOP: Parallel Lines and Transversals

142 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

143 ANS: 3

$4x + 14 + 8x + 10 = 180$

$12x = 156$

$x = 13$

PTS: 2 REF: 081213ge STA: G.G.35 TOP: Parallel Lines and Transversals

144 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

145 ANS:

$180 - (90 + 63) = 27$

PTS: 2 REF: 061230ge STA: G.G.35 TOP: Parallel Lines and Transversals

146 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

147 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

148 ANS: 3

$x^2 + 7^2 = (x+1)^2 \qquad x + 1 = 25$

$x^2 + 49 = x^2 + 2x + 1$

$48 = 2x$

$24 = x$

PTS: 2 REF: 081127ge STA: G.G.48 TOP: Pythagorean Theorem

149 ANS: 3

$8^2 + 24^2 \neq 25^2$

PTS: 2 REF: 011111ge STA: G.G.48 TOP: Pythagorean Theorem

150 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

151 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

152 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

153 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

154 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

155 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

156 ANS: 4 PTS: 2 REF: 081206ge STA: G.G.30

TOP: Interior and Exterior Angles of Triangles

157 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

158 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

159 ANS: 4
$180 - (40 + 40) = 100$

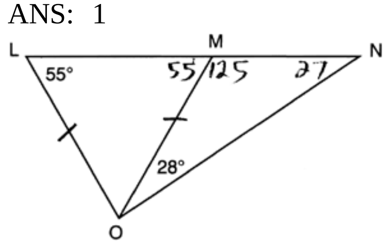
PTS: 2 REF: 080903ge STA: G.G.31 TOP: Isosceles Triangle Theorem

160 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31
TOP: Isosceles Triangle Theorem

161 ANS: 3 PTS: 2 REF: 061004ge STA: G.G.31
TOP: Isosceles Triangle Theorem

162 ANS: 4 PTS: 2 REF: 061124ge STA: G.G.31
TOP: Isosceles Triangle Theorem

163 ANS: 1



PTS: 2 REF: 061211ge STA: G.G.31 TOP: Isosceles Triangle Theorem

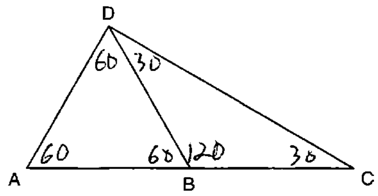
164 ANS: 2
$3x + x + 20 + x + 20 = 180$

$$5x = 40$$

$$x = 28$$

PTS: 2 REF: 081222ge STA: G.G.31 TOP: Isosceles Triangle Theorem

165 ANS:

30. 

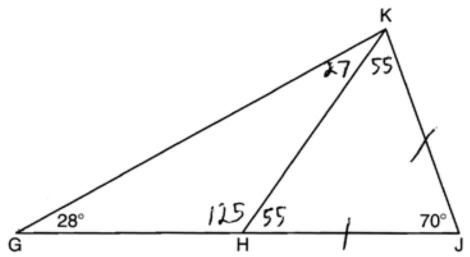
PTS: 2 REF: 011129ge STA: G.G.31 TOP: Isosceles Triangle Theorem

166 ANS:

67. $\frac{180-46}{2}=67$

PTS: 2 REF: 011029ge STA: G.G.31 TOP: Isosceles Triangle Theorem

167 ANS:

No, $\angle KGH$ is not congruent to $\angle GKH$. 

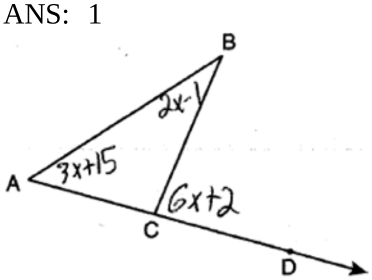
PTS: 2 REF: 081135ge STA: G.G.31 TOP: Isosceles Triangle Theorem

168 ANS: 4

(4) is not true if $\angle PQR$ is obtuse.

PTS: 2 REF: 060924ge STA: G.G.32 TOP: Exterior Angle Theorem

169 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

170 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

171 ANS: 2 PTS: 2 REF: 061107ge STA: G.G.32
TOP: Exterior Angle Theorem

172 ANS: 3 PTS: 2 REF: 081111ge STA: G.G.32
TOP: Exterior Angle Theorem

173 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

174 ANS: 2

$7 + 18 > 6 + 12$

PTS: 2 REF: fall0819ge STA: G.G.33 TOP: Triangle Inequality Theorem

175 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

176 ANS: 2 PTS: 2 REF: 011206ge STA: G.G.32
TOP: Exterior Angle Theorem

177 ANS: 2

$6 + 17 > 22$

PTS: 2 REF: 080916ge STA: G.G.33 TOP: Triangle Inequality Theorem

178 ANS: 2

$5 - 3 = 2, 5 + 3 = 8$

PTS: 2 REF: 011228ge STA: G.G.33 TOP: Triangle Inequality Theorem

179 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

180 ANS: 1 PTS: 2 REF: 061010ge STA: G.G.34
TOP: Angle Side Relationship

181 ANS: 4
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

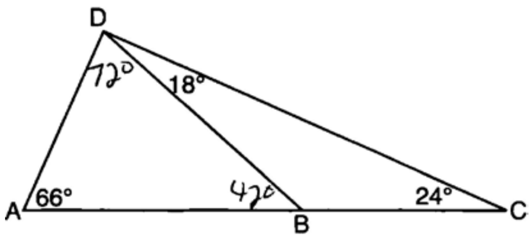
PTS: 2 REF: 081011ge STA: G.G.34 TOP: Angle Side Relationship

182 ANS: 4
$m\angle A = 80$

PTS: 2 REF: 011115ge STA: G.G.34 TOP: Angle Side Relationship

183 ANS: 4 PTS: 2 REF: 011222ge STA: G.G.34
TOP: Angle Side Relationship

184 ANS: 1



PTS: 2 REF: 081219ge STA: G.G.34 TOP: Angle Side Relationship

185 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

186 ANS: 2

$$\frac{3}{7} = \frac{6}{x}$$

$$3x = 42$$

$$x = 14$$

PTS: 2 REF: 081027ge STA: G.G.46 TOP: Side Splitter Theorem

187 ANS: 3

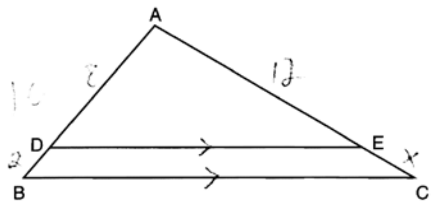
$$\frac{5}{7} = \frac{10}{x}$$

$$5x = 70$$

$$x = 14$$

PTS: 2 REF: 081103ge STA: G.G.46 TOP: Side Splitter Theorem

188 ANS: 3



$\frac{8}{2} = \frac{12}{x}$.

$8x = 24$

$x = 3$

PTS: 2 REF: 061216ge STA: G.G.46 TOP: Side Splitter Theorem

189 ANS: 4

$\Delta ABC \sim \Delta DBE$. $\frac{\overline{AB}}{\overline{DB}} = \frac{\overline{AC}}{\overline{DE}}$

$\frac{9}{2} = \frac{x}{3}$

$x = 13.5$

PTS: 2 REF: 060927ge STA: G.G.46 TOP: Side Splitter Theorem

190 ANS:

5. $\frac{3}{x} = \frac{6+3}{15}$

$9x = 45$

$x = 5$

PTS: 2 REF: 011033ge STA: G.G.46 TOP: Side Splitter Theorem

191 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

192 ANS:

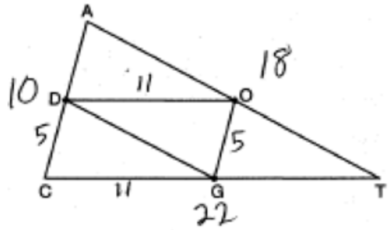
16.7. $\frac{x}{25} = \frac{12}{18}$

$18x = 300$

$x \approx 16.7$

PTS: 2 REF: 061133ge STA: G.G.46 TOP: Side Splitter Theorem

193 ANS: 3



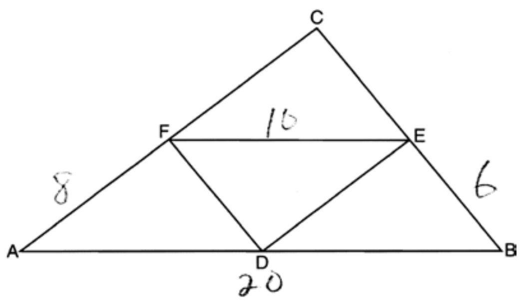
PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

194 ANS: 2

$$\frac{4x+10}{2} = 2x+5$$

PTS: 2 REF: 011103ge STA: G.G.42 TOP: Midsegments

195 ANS: 4

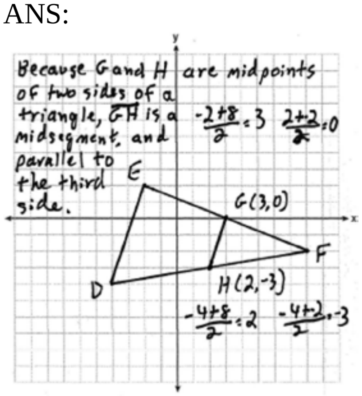


$20 + 8 + 10 + 6 = 44.$

PTS: 2 REF: 061211ge STA: G.G.42 TOP: Midsegments

196 ANS: 3 PTS: 2 REF: 081227ge STA: G.G.42
TOP: Midsegments

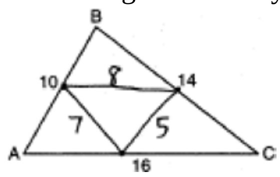
197 ANS:



PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments

198 ANS:
20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5 + 7 + 8 = 20$.

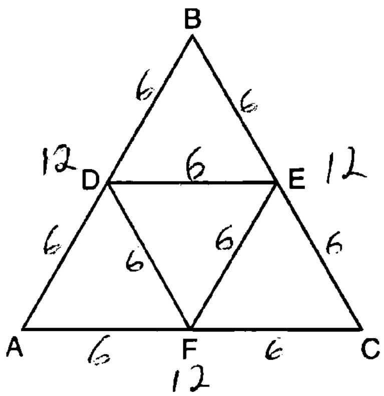


PTS: 2 REF: 060929ge STA: G.G.42 TOP: Midsegments

199 ANS:
37. Since $\overline{DE}$ is a midsegment, $AC = 14$. $10 + 13 + 14 = 37$

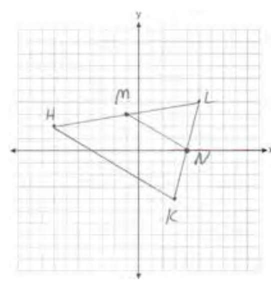
PTS: 2 REF: 061030ge STA: G.G.42 TOP: Midsegments

200 ANS: 1



PTS: 2 REF: 081003ge STA: G.G.42 TOP: Midsegments

201 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

202 ANS: 3 PTS: 2 REF: fall0825ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

203 ANS: 3 PTS: 2 REF: 011202ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

204 ANS: 4 PTS: 2 REF: 081224ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

205 ANS: 1 PTS: 2 REF: 061214ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

206 ANS: 4 PTS: 2 REF: 080925ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

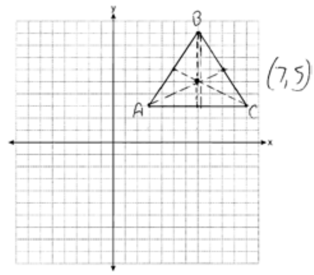
207 ANS: 4
$\overline{BG}$ is also an angle bisector since it intersects the concurrence of $\overline{CD}$ and $\overline{AE}$

PTS: 2 REF: 061025ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

208 ANS: 1 PTS: 2 REF: 081028ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

209 ANS: 3 PTS: 2 REF: 011110ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

210 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

211 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

212 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

213 ANS: 1 PTS: 2 REF: 061104ge STA: G.G.43
TOP: Centroid

214 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

215 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

216 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

217 ANS: 1

Since $\overline{AC} \cong \overline{BC}$, $m\angle A = m\angle B$ under the Isosceles Triangle Theorem.

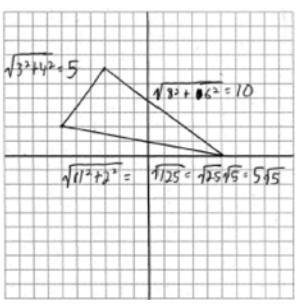
PTS: 2 REF: fall0809ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

218 ANS: 2 PTS: 2 REF: 061115ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

219 ANS: 2 PTS: 2 REF: 081226ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

220 ANS:

$15 + 5\sqrt{5}$.



PTS: 4 REF: 060936ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

221 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

222 ANS: 3

$$180(n-2) = n\left(180 - \frac{180(n-2)}{n}\right)$$

$$180n - 360 = 180n - 180n + 360$$

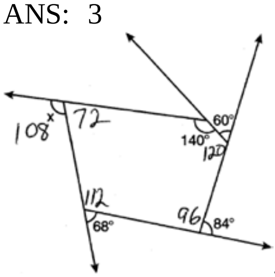
$$180n = 720$$

$$n = 4$$

PTS: 2 REF: 081223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

223 ANS: 3 PTS: 2 REF: 061218ge STA: G.G.36
TOP: Interior and Exterior Angles of Polygons

224 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

225 ANS: 3

$(n-2)180 = (5-2)180 = 540$

PTS: 2 REF: 011223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

226 ANS: 4

$(n-2)180 = (8-2)180 = 1080$. $\frac{1080}{8} = 135$.

PTS: 2 REF: fall0827ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

227 ANS: 2

$(n-2)180 = (6-2)180 = 720$. $\frac{720}{6} = 120$.

PTS: 2 REF: 081125ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

228 ANS: 1

$\angle A = \frac{(n-2)180}{n} = \frac{(5-2)180}{5} = 108$ $\angle AEB = \frac{180-108}{2} = 36$

PTS: 2 REF: 081022ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

229 ANS:

$(5-2)180 = 540$. $\frac{540}{5} = 108$ interior. $180 - 108 = 72$ exterior

PTS: 2 REF: 011131ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

230 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

231 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

232 ANS: 3 PTS: 2 REF: 011104ge STA: G.G.38
TOP: Parallelograms

233 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms

234 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

235 ANS: 1 PTS: 2 REF: 011112ge STA: G.G.39
TOP: Special Parallelograms

236 ANS: 3

$\sqrt{5^2 + 12^2} = 13$

PTS: 2 REF: 061116ge STA: G.G.39 TOP: Special Parallelograms

237 ANS: 1 PTS: 2 REF: 061125ge STA: G.G.39
TOP: Special Parallelograms

238 ANS: 1 PTS: 2 REF: 081121ge STA: G.G.39
TOP: Special Parallelograms

239 ANS: 3 PTS: 2 REF: 081128ge STA: G.G.39
TOP: Special Parallelograms

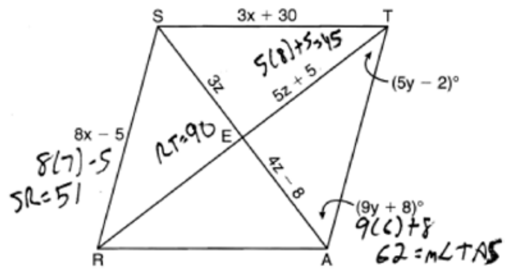
240 ANS: 3 PTS: 2 REF: 061228ge STA: G.G.39
TOP: Special Parallelograms

241 ANS: 2

The diagonals of a rhombus are perpendicular. $180 - (90 + 12) = 78$

PTS: 2 REF: 011204ge STA: G.G.39 TOP: Special Parallelograms

242 ANS:



$8x - 5 = 3x + 30$. $4z - 8 = 3z$. $9y + 8 + 5y - 2 = 90$.

$5x = 35$ $z = 8$ $14y + 6 = 90$

$x = 7$ $14y = 84$

$y = 6$

PTS: 6 REF: 061038ge STA: G.G.39 TOP: Special Parallelograms

243 ANS: 4 PTS: 2 REF: 061008ge STA: G.G.40
TOP: Trapezoids

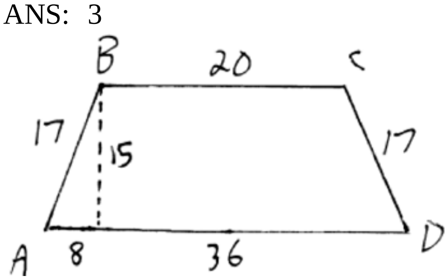
244 ANS: 3
The diagonals of an isosceles trapezoid are congruent. $5x + 3 = 11x - 5$.

$6x = 18$

$x = 3$

PTS: 2 REF: fall0801ge STA: G.G.40 TOP: Trapezoids

245 ANS: 3



$\frac{36 - 20}{2} = 8$. $\sqrt{17^2 - 8^2} = 15$

PTS: 2 REF: 061016ge STA: G.G.40 TOP: Trapezoids

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

246 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

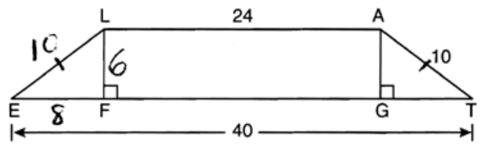
247 ANS: 4

$\sqrt{25^2-\left(\frac{26-12}{2}\right)^2}=24$

PTS: 2 REF: 011219ge STA: G.G.40 TOP: Trapezoids

248 ANS: 1

$\frac{40-24}{2}=8.$ $\sqrt{10^2-8^2}=6.$



PTS: 2 REF: 061204ge STA: G.G.40 TOP: Trapezoids

249 ANS: 1

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+3+5x-9}{2}=2x+2.$

$6x-6=4x+4$

$2x=10$

$x=5$

PTS: 2 REF: 081221ge STA: G.G.40 TOP: Trapezoids

250 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

251 ANS:

70. $3x+5+3x+5+2x+2x=180$

$10x+10=360$

$10x=350$

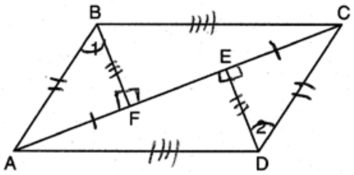
$x=35$

$2x=70$

PTS: 2 REF: 081029ge STA: G.G.40 TOP: Trapezoids

252 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41
TOP: Special Quadrilaterals

253 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); $\Delta BFA \cong \Delta DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\Delta BFC \cong \Delta DEA$ (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.41 TOP: Special Quadrilaterals

254 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.41 TOP: Special Quadrilaterals

255 ANS: 2

Adjacent sides of a rectangle are perpendicular and have opposite and reciprocal slopes.

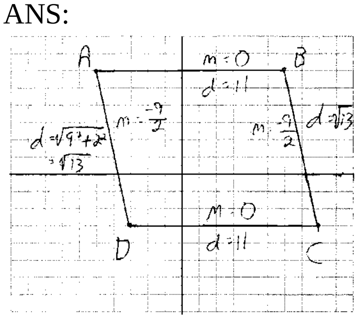
PTS: 2 REF: 061028ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

256 ANS: 1

The diagonals of a parallelogram intersect at their midpoints. $M_{\overline{AC}}\left(\dfrac{1+3}{2}, \dfrac{5+(-1)}{2}\right) = (2,2)$

PTS: 2 REF: 061209ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

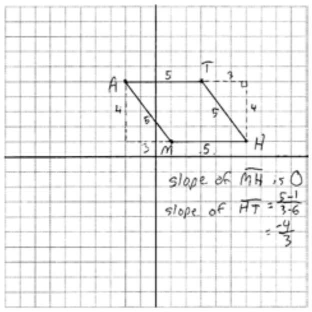
257 ANS:



$\overline{AB} \parallel \overline{CD}$ 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

258 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

259 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: $m_{\overline{AD}} = \frac{3--2}{-2--6} = \frac{5}{4}$ $\overline{AF} \parallel \overline{DE}$ because all horizontal lines have the same slope. *ADEF*

$$m_{FE} = \frac{3--2}{4-0} = \frac{5}{4}$$

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

260 ANS: 3

Because $\overline{OC}$ is a radius, its length is 5. Since $CE = 2$ $OE = 3$. ΔEDO is a 3-4-5 triangle. If $ED = 4$, $BD = 8$.

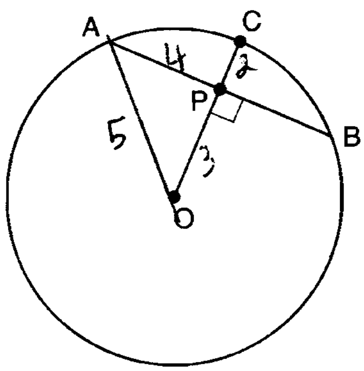
PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

261 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

262 ANS: 3



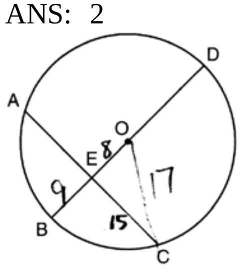
PTS: 2 REF: 011112ge STA: G.G.49 TOP: Chords

263 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

264 ANS: 2



$\sqrt{17^2 - 15^2} = 8$. $17 - 8 = 9$

PTS: 2 REF: 061221ge STA: G.G.49 TOP: Chords

265 ANS:

$EO = 6$. $CE = \sqrt{10^2 - 6^2} = 8$

PTS: 2 REF: 011234ge STA: G.G.49 TOP: Chords

266 ANS: 2

Parallel chords intercept congruent arcs. $m\overset{\frown}{AD} = m\overset{\frown}{BC} = 60$. $m\angle CDB = \frac{1}{2} m\overset{\frown}{BC} = 30$.

PTS: 2 REF: 060906ge STA: G.G.52 TOP: Chords

267 ANS: 2

Parallel chords intercept congruent arcs. $m\overset{\frown}{AC} = m\overset{\frown}{BD} = 30$. $180 - 30 - 30 = 120$.

PTS: 2 REF: 080904ge STA: G.G.52 TOP: Chords

268 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061001ge STA: G.G.52 TOP: Chords

269 ANS: 1
Parallel lines intercept congruent arcs.

PTS: 2 REF: 061105ge STA: G.G.52 TOP: Chords

270 ANS: 4
Parallel lines intercept congruent arcs.

PTS: 2 REF: 081201ge STA: G.G.52 TOP: Chords

271 ANS: 3
$\frac{180-70}{2}=55$

PTS: 2 REF: 061205ge STA: G.G.52 TOP: Chords

272 ANS:
$\frac{180-80}{2}=50$

PTS: 2 REF: 081129ge STA: G.G.52 TOP: Chords

273 ANS:
$2x-20=x+20$. $m\overset{\frown}{AB}=x+20=40+20=60$
$x=40$

PTS: 2 REF: 011229ge STA: G.G.52 TOP: Chords

274 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
TOP: Tangents KEY: common tangency

275 ANS: 3 PTS: 2 REF: 080928ge STA: G.G.50
TOP: Tangents KEY: common tangency

276 ANS: 1 PTS: 2 REF: 061013ge STA: G.G.50
TOP: Tangents KEY: point of tangency

277 ANS: 2 PTS: 2 REF: 081214ge STA: G.G.50
TOP: Tangents KEY: point of tangency

278 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50
TOP: Tangents KEY: two tangents

279 ANS: 4
$\sqrt{25^2-7^2}=24$

PTS: 2 REF: 081105ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

280 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

281 ANS: 2

$\frac{87+35}{2} = \frac{122}{2} = 61$

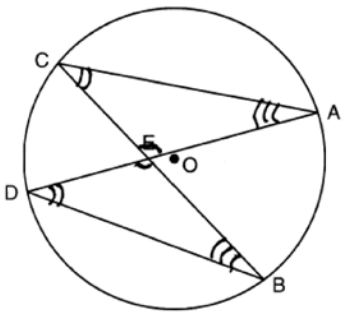
PTS: 2 REF: 011015ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

282 ANS: 3

$\frac{36+20}{2} = 28$

PTS: 2 REF: 061019ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

283 ANS: 2



PTS: 2 REF: 061026GE STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

284 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

285 ANS: 4 PTS: 2 REF: 011124ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

286 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

287 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

288 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°. $m\overset{\frown}{FE} = \frac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by $\overset{\frown}{FE}$, their measure is 24°. $m\overset{\frown}{GD} = \frac{7}{15} \times 360 = 168$. 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

289 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

290 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

291 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

292 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

293 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

294 ANS: 2

$(d+4)4=12(6)$

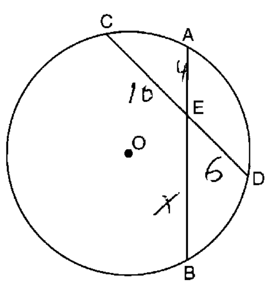
$4d+16=72$

$d=14$

$r=7$

PTS: 2 REF: 061023ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

295 ANS: 1

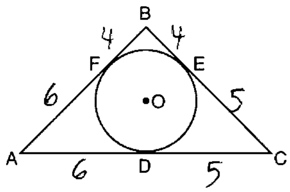


$4x=6\cdot 10$

$x=15$

PTS: 2 REF: 081017ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

296 ANS: 3



PTS: 2 REF: 011101ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two tangents

297 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

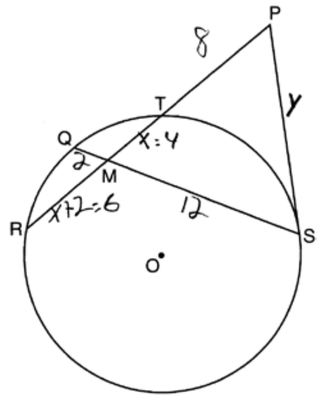
298 ANS: 4 PTS: 2 REF: 011208ge STA: G.G.53
TOP: Segments Intercepted by Circle KEY: two tangents

299 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

300 ANS:



$x(x+2)=12\cdot 2$. $\overline{RT}=6+4=10$. $y\cdot y=18\cdot 8$

$$x^2+2x-24=0 \qquad y^2=144$$

$$(x+6)(x-4)=0 \qquad y=12$$

$$x=4$$

PTS: 4 REF: 061237ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

301 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

302 ANS: 2 PTS: 2 REF: 060910ge STA: G.G.71
TOP: Equations of Circles

303 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71
TOP: Equations of Circles

304 ANS: 3 PTS: 2 REF: 011116ge STA: G.G.71
TOP: Equations of Circles

305 ANS: 4 PTS: 2 REF: 081110ge STA: G.G.71
TOP: Equations of Circles

306 ANS: 4 PTS: 2 REF: 011212ge STA: G.G.71
TOP: Equations of Circles

307 ANS: 3 PTS: 2 REF: 061210ge STA: G.G.71
TOP: Equations of Circles

308 ANS: 3 PTS: 2 REF: 081209ge STA: G.G.71
TOP: Equations of Circles

309 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

310 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72
TOP: Equations of Circles

311 ANS: 4

The radius is 4. $r^2 = 16$.

PTS: 2 REF: 061014ge STA: G.G.72 TOP: Equations of Circles

312 ANS: 1 PTS: 2 REF: 061110ge STA: G.G.72
TOP: Equations of Circles

313 ANS: 1 PTS: 2 REF: 011220ge STA: G.G.72
TOP: Equations of Circles

314 ANS: 2 PTS: 2 REF: 081212ge STA: G.G.72
TOP: Equations of Circles

315 ANS:

$(x+1)^2 + (y-2)^2 = 36$

PTS: 2 REF: 081034ge STA: G.G.72 TOP: Equations of Circles

316 ANS:

$(x-5)^2 + (y+4)^2 = 36$

PTS: 2 REF: 081132ge STA: G.G.72 TOP: Equations of Circles

317 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73
TOP: Equations of Circles

318 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles

319 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73
TOP: Equations of Circles

320 ANS: 1 PTS: 2 REF: 081009ge STA: G.G.73
TOP: Equations of Circles

321 ANS: 4 PTS: 2 REF: 061114ge STA: G.G.73
TOP: Equations of Circles

322 ANS: 2 PTS: 2 REF: 011203ge STA: G.G.73
TOP: Equations of Circles

323 ANS: 1 PTS: 2 REF: 061223ge STA: G.G.73
TOP: Equations of Circles

324 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles

325 ANS: 2 PTS: 2 REF: 011020ge STA: G.G.74
TOP: Graphing Circles

326 ANS: 2 PTS: 2 REF: 011125ge STA: G.G.74
TOP: Graphing Circles

327 ANS: 3 PTS: 2 REF: 061220ge STA: G.G.74
TOP: Graphing Circles

328 ANS:

4. $l_1w_1h_1 = l_2w_2h_2$

$10 \times 2 \times h = 5 \times w_2 \times h$

$20 = 5w_2$

$w_2 = 4$

PTS: 2 REF: 011030ge STA: G.G.11 TOP: Volume

329 ANS: 1

$3x^2 + 18x + 24$

$3(x^2 + 6x + 8)$

$3(x + 4)(x + 2)$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume

330 ANS: 3 PTS: 2 REF: 081123ge STA: G.G.12
TOP: Volume

331 ANS: 2 PTS: 2 REF: 011215ge STA: G.G.12
TOP: Volume

332 ANS:

9.1. $(11)(8)h = 800$

$h \approx 9.1$

PTS: 2 REF: 061131ge STA: G.G.12 TOP: Volume

333 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

334 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

335 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

336 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

337 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

338 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

339 ANS:

$V = \pi r^2 h$. $L = 2\pi rh = 2\pi \cdot 5\sqrt{2} \cdot 12 \approx 533.1$

$$600\pi = \pi r^2 \cdot 12$$
$$50 = r^2$$
$$\sqrt{25}\sqrt{2} = r$$
$$5\sqrt{2} = r$$

PTS: 4 REF: 011236ge STA: G.G.14 TOP: Volume

340 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: Lateral Area

341 ANS:

$V = \pi r^2 h = \pi (5)^2 \cdot 7 = 175\pi$

PTS: 2 REF: 081231ge STA: G.G.14 TOP: Volume

342 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

343 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

344 ANS:
375π $L = \pi r l = \pi(15)(25) = 375\pi$

PTS: 2 REF: 081030ge STA: G.G.15 TOP: Lateral Area

345 ANS: 4

$\text{SA} = 4\pi r^2$ $V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 6^3 = 288\pi$

$$144\pi = 4\pi r^2$$

$$36 = r^2$$

$$6 = r$$

PTS: 2 REF: 081020ge STA: G.G.16 TOP: Surface Area

346 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

347 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

348 ANS:

$V = \frac{4}{3}\pi \cdot 9^3 = 972\pi$

PTS: 2 REF: 081131ge STA: G.G.16 TOP: Surface Area

349 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: Surface Area

350 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

351 ANS: 4

Corresponding angles of similar triangles are congruent.

PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

352 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

353 ANS: 4 PTS: 2 REF: 081023ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

354 ANS: 3 PTS: 2 REF: 061224ge STA: G.G.45
TOP: Similarity KEY: basic

355 ANS: 4 PTS: 2 REF: 081216ge STA: G.G.45
TOP: Similarity KEY: basic

356 ANS:

20. $5x + 10 = 4x + 30$

$x = 20$

PTS: 2 REF: 060934ge STA: G.G.45 TOP: Similarity
KEY: basic

357 ANS: 4

$180 - (50 + 30) = 100$

PTS: 2 REF: 081006ge STA: G.G.45 TOP: Similarity
KEY: basic

358 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

359 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

360 ANS: 1

$\overline{AB} = 10$ since ΔABC is a 6-8-10 triangle. $6^2 = 10x$

$3.6 = x$

PTS: 2 REF: 060915ge STA: G.G.47 TOP: Similarity
KEY: leg

361 ANS: 4

Let $\overline{AD} = x$. $36x = 12^2$

$x = 4$

PTS: 2 REF: 080922ge STA: G.G.47 TOP: Similarity
KEY: leg

362 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

363 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

364 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: leg

365 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

366 ANS:

2.4. $5a = 4^2$ $5b = 3^2$ $h^2 = ab$

$a = 3.2$ $b = 1.8$ $h^2 = 3.2 \cdot 1.8$

$h = \sqrt{5.76} = 2.4$

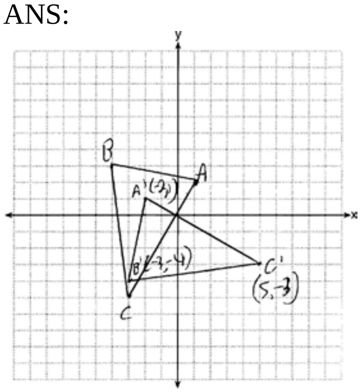
PTS: 4 REF: 081037ge STA: G.G.47 TOP: Similarity
KEY: altitude

367 ANS:

$R'(-3,-2)$, $S'(-4,4)$, and $T'(2,2)$.

PTS: 2 REF: 011232ge STA: G.G.54 TOP: Rotations

368 ANS:



$A'(-2,1)$, $B'(-3,-4)$, and $C'(5,-3)$

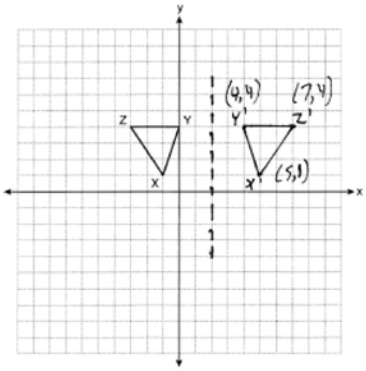
PTS: 2 REF: 081230ge STA: G.G.54 TOP: Rotations

369 ANS: 3 PTS: 2 REF: 060905ge STA: G.G.54
TOP: Reflections KEY: basic

370 ANS: 2 PTS: 2 REF: 081108ge STA: G.G.54
TOP: Reflections KEY: basic

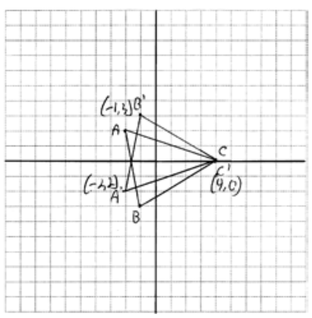
371 ANS: 1 PTS: 2 REF: 081113ge STA: G.G.54
TOP: Reflections KEY: basic

372 ANS:



PTS: 2 REF: 061032ge STA: G.G.54 TOP: Reflections
KEY: grids

373 ANS:



PTS: 2 REF: 011130ge STA: G.G.54 TOP: Reflections
KEY: grids

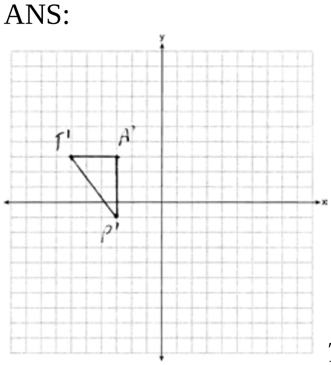
374 ANS: 1
$(x,y) \rightarrow (x+3, y+1)$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

375 ANS: 3
$-5+3=-2 \qquad 2+-4=-2$

PTS: 2 REF: 011107ge STA: G.G.54 TOP: Translations

376 ANS:



$T'(-6,3), A'(-3,3), P'(-3,-1)$

PTS: 2 REF: 061229ge STA: G.G.54 TOP: Translations

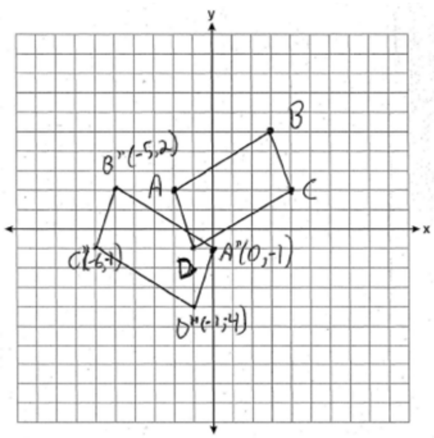
377 ANS: 1
$A'(2,4)$

PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

378 ANS: 3
$(3,-2) \rightarrow (2,3) \rightarrow (8,12)$

PTS: 2 REF: 011126ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

379 ANS:

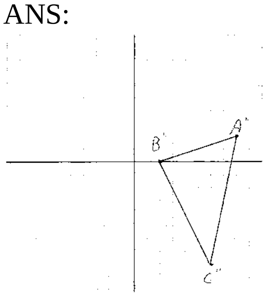


PTS: 4 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

380 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

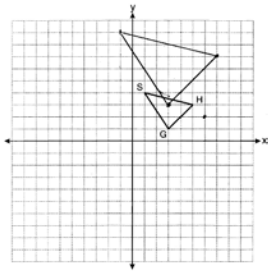
381 ANS:



$A''(8,2),\ B''(2,0),\ C''(6,-8)$

PTS: 4 REF: 081036ge STA: G.G.58 TOP: Compositions of Transformations

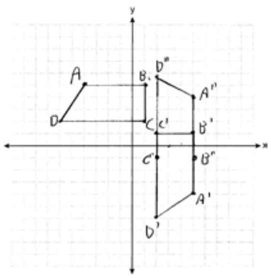
382 ANS:



$G''(3,3), H''(7,7), S''(-1,9)$

PTS: 4 REF: 081136ge STA: G.G.58 TOP: Compositions of Transformations

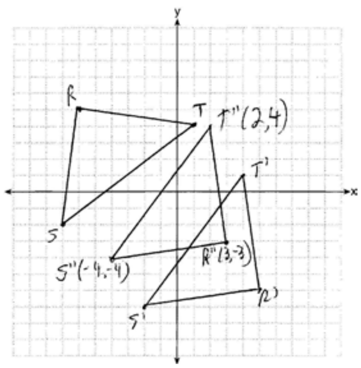
383 ANS:



$A'(5,-4)$, $B'(5,1)$, $C'(2,1)$, $D'(2,-6)$; $A''(5,4)$, $B''(5,-1)$, $C''(2,-1)$, $D''(2,6)$

PTS: 4 REF: 061236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

384 ANS:



PTS: 4 REF: 081236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

385 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

386 ANS: 1 PTS: 2 REF: 061005ge STA: G.G.55
TOP: Properties of Transformations

387 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.55
TOP: Properties of Transformations

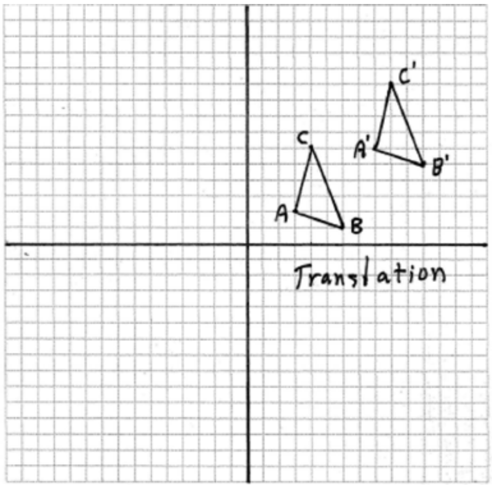
388 ANS: 1 PTS: 2 REF: 011102ge STA: G.G.55
TOP: Properties of Transformations

389 ANS: 3 PTS: 2 REF: 081104ge STA: G.G.55
TOP: Properties of Transformations

390 ANS: 2 PTS: 2 REF: 011211ge STA: G.G.55
TOP: Properties of Transformations

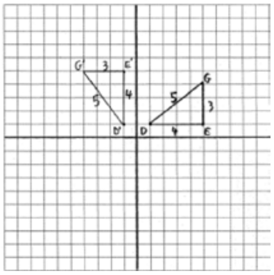
391 ANS: 2 PTS: 2 REF: 081202ge STA: G.G.55
TOP: Properties of Transformations

392 ANS:



PTS: 2 REF: fall0830ge STA: G.G.55 TOP: Properties of Transformations

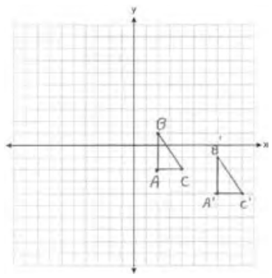
393 ANS:



$D'(-1,1)$, $E'(-1,5)$, $G'(-4,5)$

PTS: 4 REF: 080937ge STA: G.G.55 TOP: Properties of Transformations

394 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

395 ANS: 3 PTS: 2 REF: 081021ge STA: G.G.57
TOP: Properties of Transformations

396 ANS: 2 PTS: 2 REF: 061126ge STA: G.G.59
TOP: Properties of Transformations

397 ANS: 2 PTS: 2 REF: 061201ge STA: G.G.59
TOP: Properties of Transformations
398 ANS: 3 PTS: 2 REF: 081204ge STA: G.G.59
TOP: Properties of Transformations
399 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
400 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations
401 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations
402 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Identifying Transformations
403 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations
404 ANS: 4 PTS: 2 REF: 061018ge STA: G.G.56
TOP: Identifying Transformations
405 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
TOP: Identifying Transformations
406 ANS: 2 PTS: 2 REF: 061227ge STA: G.G.56
TOP: Identifying Transformations
407 ANS:
Yes. A reflection is an isometry.

PTS: 2 REF: 061132ge STA: G.G.56 TOP: Identifying Transformations
408 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations
409 ANS: 2
A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations
410 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations
411 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations
412 ANS: 1
Translations and reflections do not affect distance.

PTS: 2 REF: 080908ge STA: G.G.61
TOP: Analytical Representations of Transformations
413 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
414 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

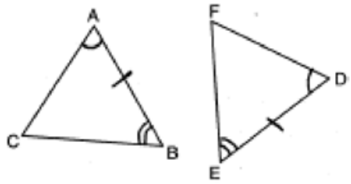
415 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations
416 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations
417 ANS: 1 PTS: 2 REF: 011213ge STA: G.G.24
TOP: Negations
418 ANS: 2 PTS: 2 REF: 061202ge STA: G.G.24
TOP: Negations
419 ANS:
The medians of a triangle are not concurrent. False.

PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations
420 ANS:
2 is not a prime number, false.

PTS: 2 REF: 081229ge STA: G.G.24 TOP: Negations
421 ANS: 4 PTS: 2 REF: 011118ge STA: G.G.25
TOP: Compound Statements KEY: general
422 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction
423 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
424 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements
425 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse and Biconditional
426 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements
427 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26
TOP: Contrapositive
428 ANS:
Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

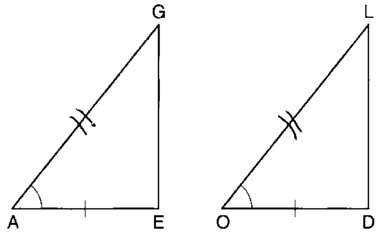
PTS: 2 REF: fall0834ge STA: G.G.26 TOP: Conditional Statements
429 ANS: 3



PTS: 2 REF: 060902ge STA: G.G.28 TOP: Triangle Congruency

430 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency

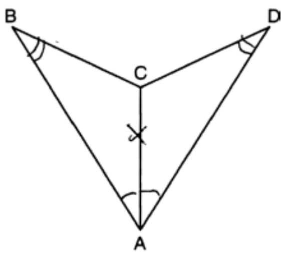
431 ANS: 2



PTS: 2 REF: 081007ge STA: G.G.28 TOP: Triangle Congruency

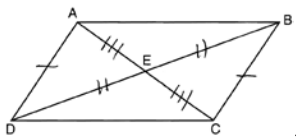
432 ANS: 1 PTS: 2 REF: 011122ge STA: G.G.28
TOP: Triangle Congruency

433 ANS: 4



PTS: 2 REF: 081114ge STA: G.G.28 TOP: Triangle Congruency

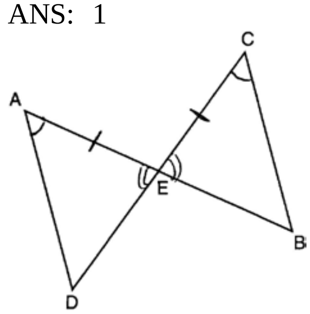
434 ANS: 3



. 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

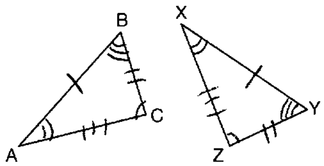
435 ANS: 1



PTS: 2 REF: 081210ge STA: G.G.28 TOP: Triangle Congruency

436 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29
TOP: Triangle Congruency

437 ANS: 4



PTS: 2 REF: 081001ge STA: G.G.29 TOP: Triangle Congruency

438 ANS: 3 PTS: 2 REF: 061102ge STA: G.G.29
TOP: Triangle Congruency

439 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency

440 ANS: 4 PTS: 2 REF: 011216ge STA: G.G.29
TOP: Triangle Congruency

441 ANS: 2

$$AC = BD$$
$$AC - BC = BD - BC$$
$$AB = CD$$

PTS: 2 REF: 061206ge STA: G.G.27 TOP: Line Proofs

442 ANS: 4 PTS: 2 REF: 011108ge STA: G.G.27
TOP: Angle Proofs

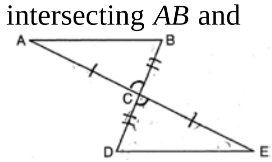
443 ANS: 1

$$AB = CD$$
$$AB + BC = CD + BC$$
$$AC = BD$$

PTS: 2 REF: 081207ge STA: G.G.27 TOP: Triangle Proofs

444 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. $\Delta ABC \cong \Delta EDC$ 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

445 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. $\Delta ABE \cong \Delta DCE$ because of ASA. $\overline{AB} \cong \overline{DC}$ because CPCTC.

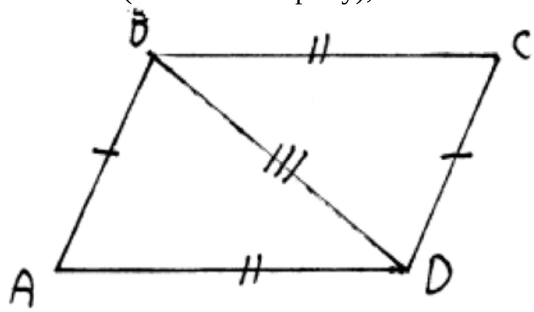
PTS: 4 REF: 061235ge STA: G.G.27 TOP: Triangle Proofs

446 ANS: 3 PTS: 2 REF: 081208ge STA: G.G.27
TOP: Quadrilateral Proofs

447 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

448 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

449 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. $\overline{DC} \cong \overline{CD}$ because of the reflexive property. Therefore, $\triangle ACD \cong \triangle BDC$ because of SAS.

PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

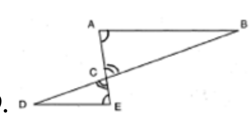
450 ANS:
$\overline{OA} \cong \overline{OB}$ because all radii are equal. $\overline{OP} \cong \overline{OP}$ because of the reflexive property. $\overline{OA} \perp \overline{PA}$ and $\overline{OB} \perp \overline{PB}$ because tangents to a circle are perpendicular to a radius at a point on a circle. $\angle PAO$ 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

451 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

452 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

453 ANS: 4 PTS: 2 REF: 011019ge STA: G.G.44
TOP: Similarity Proofs

454 ANS: 3 PTS: 2 REF: 011209ge STA: G.G.44
TOP: Similarity Proofs

455 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. $\Delta ABC \sim \Delta DEF$ because of AA.

PTS: 4 REF: 011136ge STA: G.G.44 TOP: Similarity Proofs

456 ANS:
$\angle ACB \cong \angle AED$ is given. $\angle A \cong \angle A$ because of the reflexive property. Therefore $\Delta ABC \sim \Delta ADE$ because of AA.

PTS: 2 REF: 081133ge STA: G.G.44 TOP: Similarity Proofs