JEFFERSON MATH PROJECT REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Geometry Regents Exam Questions from Fall 2008 to August 2011 Sorted by PI: Topic

(Answer Key)

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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.

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

1 ANS: 2 PTS: 2 REF: 061022ge 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

$2y = -6x + 8$ 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

4 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

5 ANS: 3

$m = \frac{-A}{B} = -\frac{3}{4}$

PTS: 2 REF: 011025ge 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:

$m = \frac{-A}{B} = \frac{6}{2} = 3$. $m_{\perp} = -\frac{1}{3}$.

PTS: 2 REF: 011134ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

9 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

10 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

11 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

12 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

13 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

14 ANS: 4

$3y + 1 = 6x + 4$. $2y + 1 = x - 9$
$$3y = 6x + 3 \qquad 2y = x - 10$$
$$y = 2x + 1 \qquad y = \frac{1}{2}x - 5$$

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

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

16 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

17 ANS: 2

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

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

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

18 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

19 ANS:

$y = \frac{2}{3}x + 1$. $2y + 3x = 6$. $y = mx + b$

$$2y = -3x + 6 \qquad 5 = \frac{2}{3}(6) + b$$
$$y = -\frac{3}{2}x + 3 \qquad 5 = 4 + b$$
$$m = -\frac{3}{2} \qquad 1 = b$$
$$m_{\perp} = \frac{2}{3} \qquad y = \frac{2}{3}x + 1$$

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

20 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

21 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

22 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

23 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

24 ANS: 2

$m = \frac{-A}{B} = \frac{-4}{2} = -2$

$$y = mx + b$$
$$2 = -2(2) + b$$
$$6 = b$$

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

25 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

26 ANS:

$y = \frac{2}{3}x - 9$. The slope of $2x - 3y = 11$ is $-\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}$. $-5 = \left(\frac{2}{3}\right)(6) + b$

$-5 = 4 + b$

$b = -9$

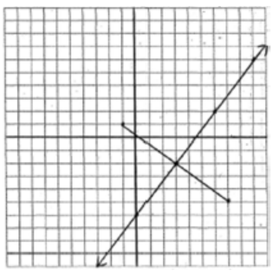
PTS: 2 REF: 080931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

27 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

28 ANS: 1

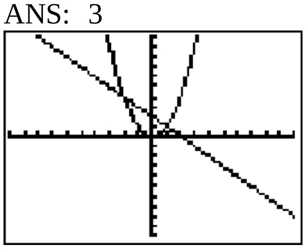
$m = \left(\frac{8+0}{2}, \frac{2+6}{2}\right) = (4,4)$ $m = \frac{6-2}{0-8} = \frac{4}{-8} = -\frac{1}{2}$ $m_\perp = 2$ $y = mx + b$

$4 = 2(4) + b$

$-4 = b$

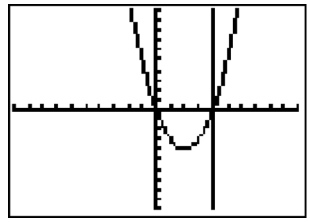
PTS: 2 REF: 081126ge STA: G.G.68 TOP: Perpendicular Bisector

29 ANS: 3



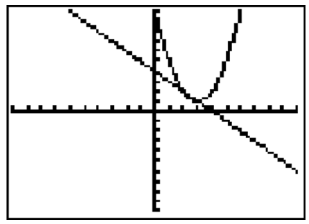
PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

30 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

31 ANS: 4



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

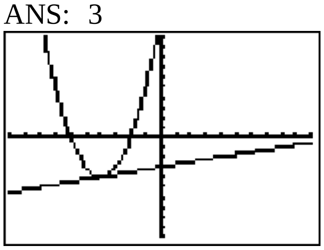
$y = -x + 4$ $\quad x^2 - 5x + 6 = 0$ $\quad y + 3 = 4$ $\quad y = 2$

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

$x = 3 \text{ or } 2$

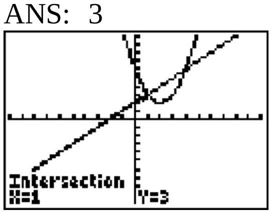
PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

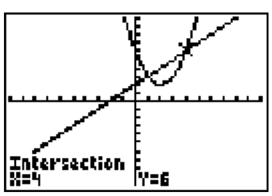
32 ANS: 3



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

33 ANS: 3





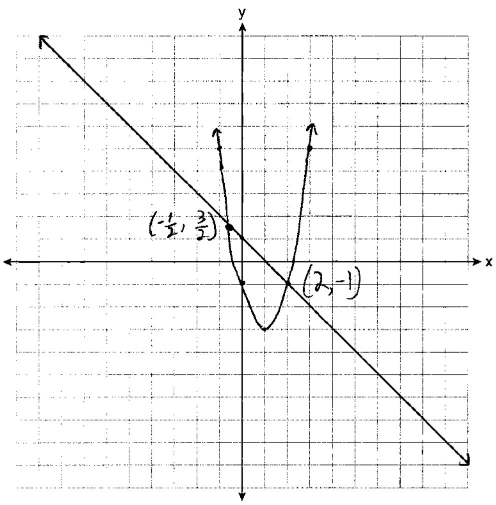
PTS: 2 REF: 081118ge STA: G.G.70 TOP: Quadratic-Linear Systems

34 ANS: 3

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

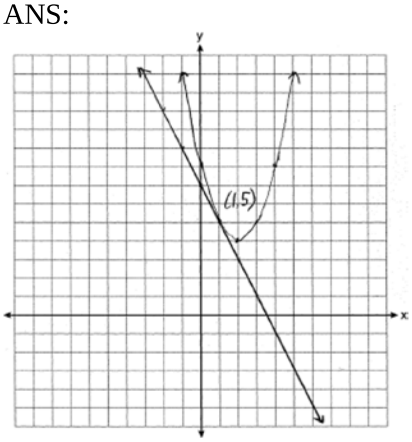
PTS: 2 REF: 081004ge STA: G.G.70 TOP: Quadratic-Linear Systems

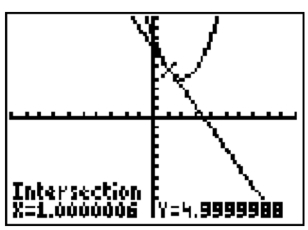
35 ANS:



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

36 ANS:





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

37 ANS: 2

$M_x = \dfrac{-2+6}{2} = 2.$ $M_y = \dfrac{-4+2}{2} = -1$

PTS: 2 REF: 080910ge STA: G.G.66 TOP: Midpoint
KEY: general

38 ANS: 2

$M_x = \dfrac{7+(-3)}{2} = 2.\ \ M_Y = \dfrac{-1+3}{2} = 1.$

PTS: 2 REF: 011106ge STA: G.G.66 TOP: Midpoint

39 ANS: 2

$M_x = \dfrac{2+(-4)}{2} = -1.\ \ M_Y = \dfrac{-3+6}{2} = \dfrac{3}{2}.$

PTS: 2 REF: fall0813ge STA: G.G.66 TOP: Midpoint
KEY: general

40 ANS: 2

$M_x = \dfrac{3x+5+x-1}{2} = \dfrac{4x+4}{2} = 2x+2.\ \ M_Y = \dfrac{3y+(-y)}{2} = \dfrac{2y}{2} = y.$

PTS: 2 REF: 081019ge STA: G.G.66 TOP: Midpoint
KEY: general

41 ANS: 4

$M_x = \dfrac{-6+1}{2} = -\dfrac{5}{2}.\ \ M_y = \dfrac{1+8}{2} = \dfrac{9}{2}.$

PTS: 2 REF: 060919ge STA: G.G.66 TOP: Midpoint
KEY: graph

42 ANS:

$(6,-4).\ \ C_x = \dfrac{Q_x + R_x}{2}.\ \ C_y = \dfrac{Q_y + R_y}{2}.$

$$3.5 = \frac{1+R_x}{2} \qquad 2 = \frac{8+R_y}{2}$$

$$7 = 1+R_x \qquad 4 = 8+R_y$$

$$6 = R_x \qquad -4 = R_y$$

PTS: 2 REF: 011031ge STA: G.G.66 TOP: Midpoint
KEY: graph

43 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

44 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

45 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

46 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

47 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

48 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

49 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

50 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

51 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

52 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

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

54 ANS: 3 PTS: 2 REF: 061017ge STA: G.G.1
TOP: Planes

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

56 ANS: 4 PTS: 2 REF: 061118ge STA: G.G.1
TOP: Planes

57 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes

58 ANS: 1 PTS: 2 REF: 011128ge STA: G.G.2
TOP: Planes

59 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes

60 ANS: 1 PTS: 2 REF: 081008ge STA: G.G.3
TOP: Planes

61 ANS: 2 PTS: 2 REF: 080927ge STA: G.G.4
TOP: Planes

62 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes

63 ANS: 1 PTS: 2 REF: 081116ge STA: G.G.7
TOP: Planes

64 ANS: 3 PTS: 2 REF: 060928ge STA: G.G.8
TOP: Planes

65 ANS: 2 PTS: 2 REF: 081120ge STA: G.G.8
TOP: Planes

66 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes

67 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes

68 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes

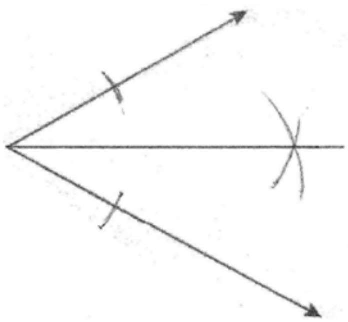
69 ANS: 3 PTS: 2 REF: 081002ge STA: G.G.9
TOP: Planes

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

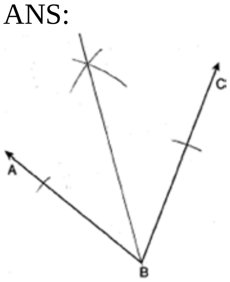
71 ANS: 3
The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids

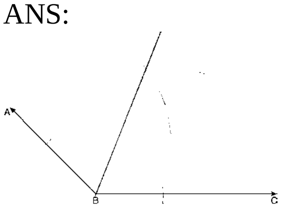
72 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids
73 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids
74 ANS: 3 PTS: 2 REF: 060925ge STA: G.G.17
TOP: Constructions
75 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17
TOP: Constructions
76 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17
TOP: Constructions
77 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions
78 ANS:



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



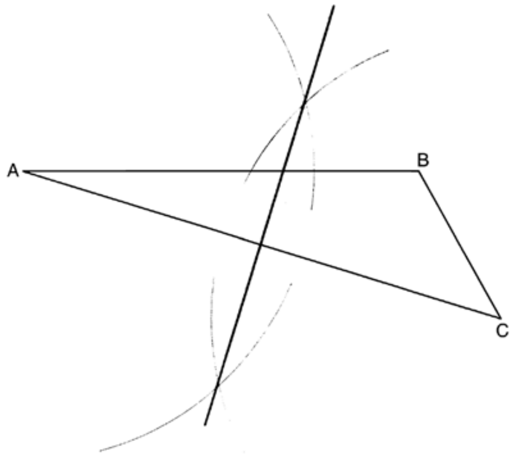
PTS: 2 REF: 080932ge STA: G.G.17 TOP: Constructions
80 ANS:



PTS: 2 REF: 011133ge STA: G.G.17 TOP: Constructions
81 ANS: 1 PTS: 2 REF: 011120ge STA: G.G.18
TOP: Constructions
82 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions
83 ANS: 2 PTS: 2 REF: 061101ge STA: G.G.18
TOP: Constructions

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

85 ANS:



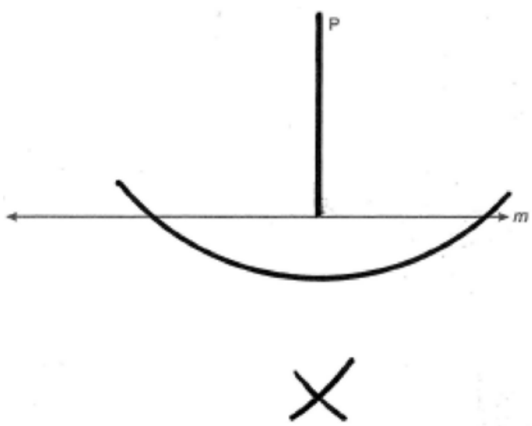
PTS: 2 REF: 081130ge STA: G.G.18 TOP: Constructions

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

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

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

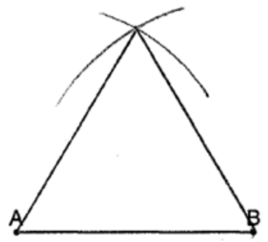
89 ANS:



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

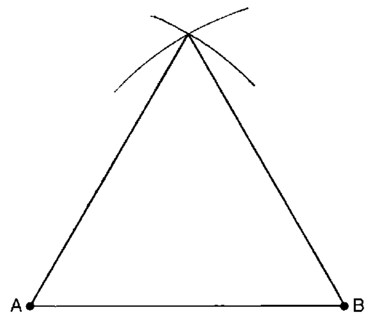
90 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions

91 ANS:



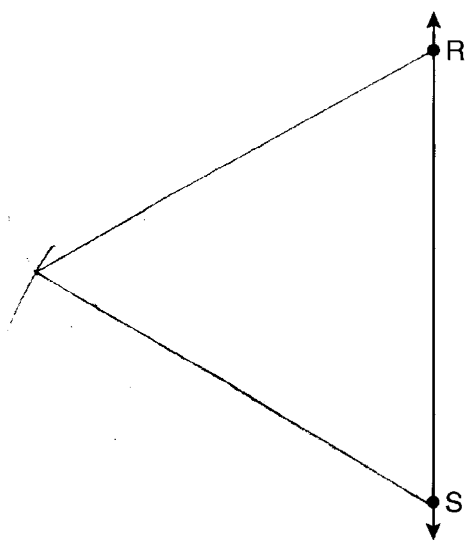
PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions

92 ANS:



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

93 ANS:

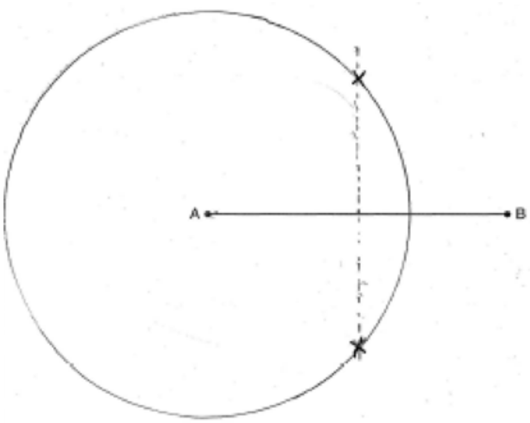


PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

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

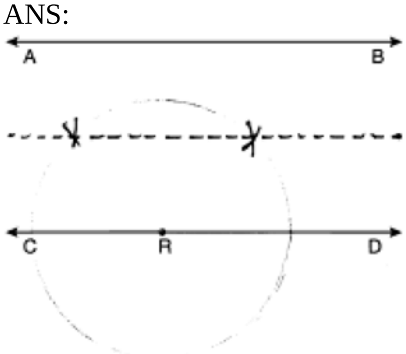
95 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

96 ANS:



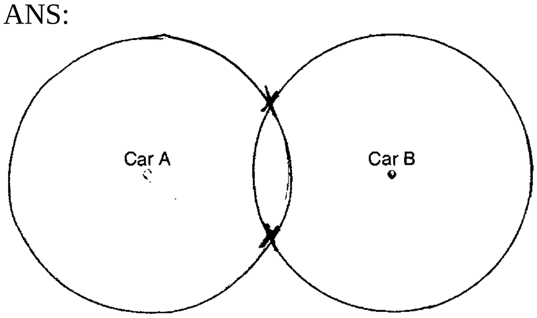
PTS: 2 REF: 060932ge STA: G.G.22 TOP: Locus

97 ANS:



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

98 ANS:

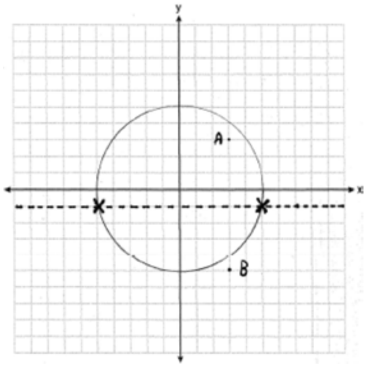


PTS: 2 REF: 081033ge STA: G.G.22 TOP: Locus

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

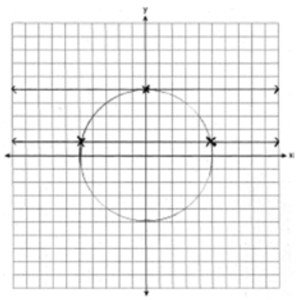
100 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

101 ANS:



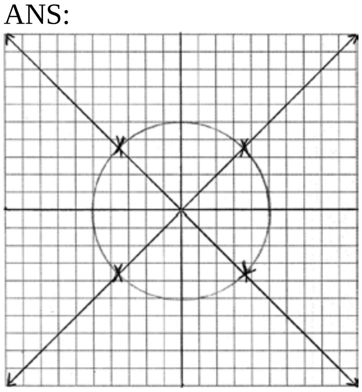
PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

102 ANS:



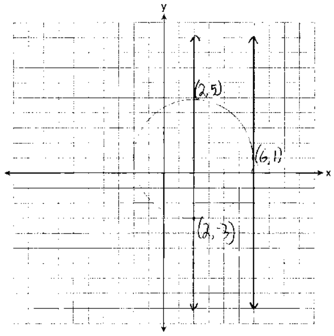
PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

103 ANS:



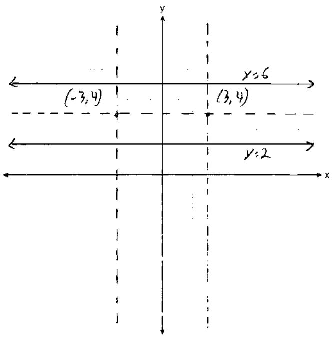
PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

104 ANS:



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

105 ANS:



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

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

107 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

108 ANS: 3

$7x = 5x + 30$

$2x = 30$

$x = 15$

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

109 ANS: 2

$7x = 5x + 30$

$2x = 30$

$x = 15$

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

110 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

111 ANS: 3

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

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

112 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

113 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

114 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

115 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

116 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

117 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

118 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

119 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

120 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

121 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

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

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

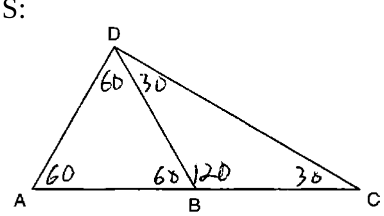
123 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31
TOP: Isosceles Triangle Theorem

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

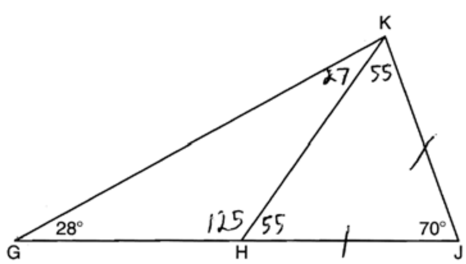
125 ANS: 4 PTS: 2 REF: 061124ge STA: G.G.31
TOP: Isosceles Triangle Theorem

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

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

127 ANS:
30.


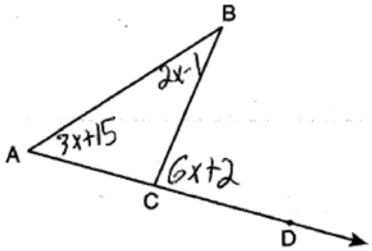
PTS: 2 REF: 011129ge STA: G.G.31 TOP: Isosceles Triangle Theorem

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


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

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

130 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

131 ANS: 3

$x + 2x + 15 = 5x + 15$ $2(5) + 15 = 25$

$3x + 15 = 5x + 5$

$10 = 2x$

$5 = x$

PTS: 2 REF: 011127ge STA: G.G.32 TOP: Exterior Angle Theorem

132 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

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

134 ANS: 4

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

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

135 ANS: 2

$6 + 17 > 22$

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

136 ANS: 2

$7 + 18 > 6 + 12$

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

137 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

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

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

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

140 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

141 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

142 ANS: 2

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

$$3x = 42$$

$$x = 14$$

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

143 ANS: 3

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

$$5x = 70$$

$$x = 14$$

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

144 ANS: 4

$\triangle ABC \sim \triangle DBE$. $\dfrac{\overline{AB}}{\overline{DB}} = \dfrac{\overline{AC}}{\overline{DE}}$

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

$$x = 13.5$$

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

145 ANS:
5. $\dfrac{3}{x} = \dfrac{6+3}{15}$

$$9x = 45$$

$$x = 5$$

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

146 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

147 ANS:

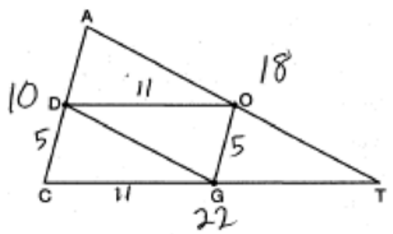
16.7. $\frac{x}{25}=\frac{12}{18}$

$18x=300$

$x\approx 16.7$

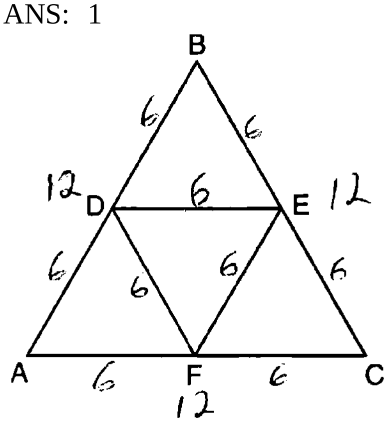
PTS: 2 REF: 061133ge STA: G.G.46 TOP: Side Splitter Theorem

148 ANS: 3



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

149 ANS: 1



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

150 ANS: 2

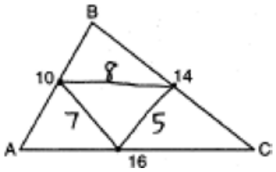
$\frac{4x+10}{2}=2x+5$

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

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

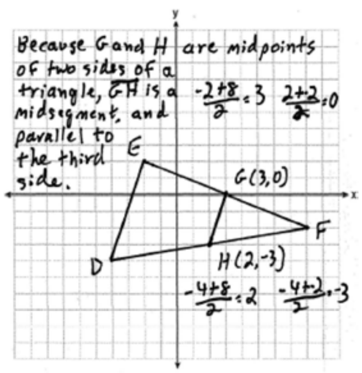
PTS: 2 REF: 061030ge STA: G.G.42 TOP: Midsegments

152 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

153 ANS:



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

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

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

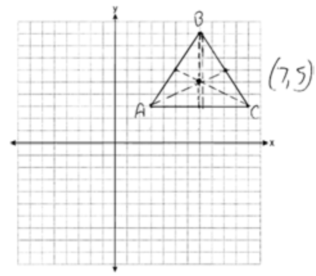
156 ANS: 4
$\overline{BG}$ is also an angle bisector since it intersects the concurrence of $\overline{CD}$ and $\overline{AE}$

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

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

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

159 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

160 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

161 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

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

163 ANS:
6. The centroid divides each median into segments whose lengths are in the ratio 2 : 1. $\overline{TD} = 6$ and $\overline{DB} = 3$

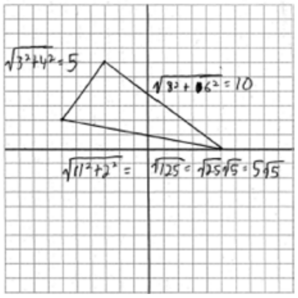
PTS: 2 REF: 011034ge STA: G.G.43 TOP: Centroid

164 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

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

166 ANS:

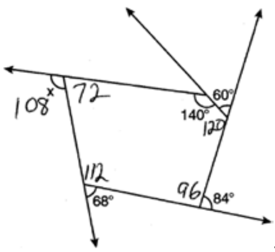


$15 + 5\sqrt{5}$.

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

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

167 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

168 ANS: 4

sum of interior $\angle$s = sum of exterior $\angle$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

169 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

170 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

171 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

172 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

173 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

174 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

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

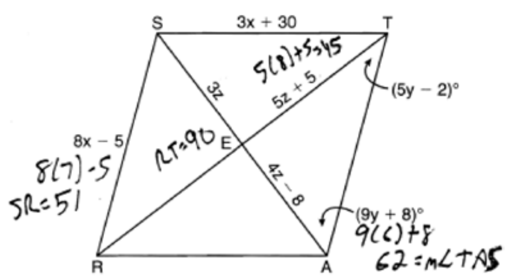
176 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms

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

178 ANS: 3
$\sqrt{5^2+12^2}=13$

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

179 ANS:



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

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

$x=7$ $\quad 14y=84$

$y=6$

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

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

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

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

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

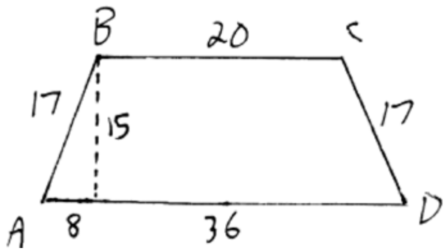
184 ANS: 3
The diagonals of an isosceles trapezoid are congruent. $5x + 3 = 11x - 5$.

$$6x = 18$$

$$x = 3$$

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

185 ANS: 3



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

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

186 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

187 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

188 ANS:
70. $3x + 5 + 3x + 5 + 2x + 2x = 180$

$$10x + 10 = 360$$

$$10x = 350$$

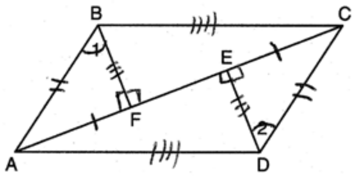
$$x = 35$$

$$2x = 70$$

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

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

190 ANS:



$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Line Segment Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); *ABCD* is a parallelogram (opposite sides of quadrilateral *ABCD* are congruent)

PTS: 6 REF: 080938ge STA: G.G.41 TOP: Special Quadrilaterals

191 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.

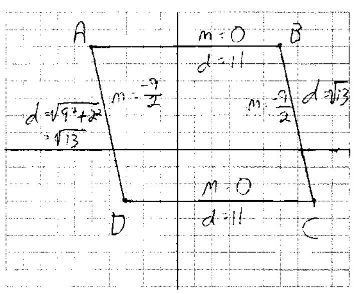
PTS: 4 REF: 011036ge STA: G.G.41 TOP: Special Quadrilaterals

192 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

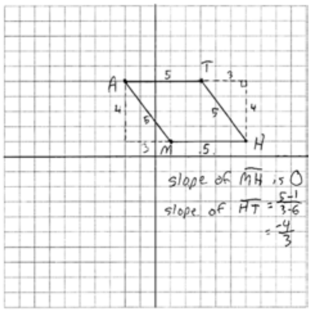
193 ANS:



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

194 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

195 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

196 ANS: 1

The closer a chord is to the center of a circle, the longer the chord.

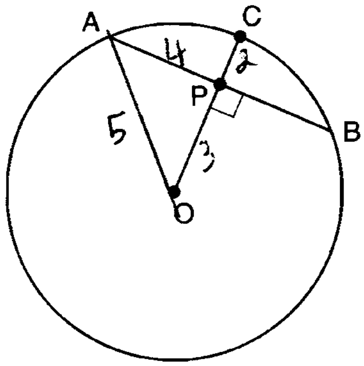
PTS: 2 REF: 011005ge STA: G.G.49 TOP: Chords

197 ANS: 3

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

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

198 ANS: 3



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

199 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

200 ANS: 1

Parallel lines intercept congruent arcs.

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

201 ANS: 1

Parallel lines intercept congruent arcs.

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

202 ANS: 2

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

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

203 ANS: 2

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

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

204 ANS:

$\frac{180-80}{2}=50$

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

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

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

207 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

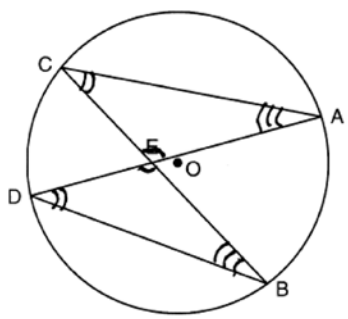
208 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50
TOP: Tangents KEY: two tangents

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

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

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

211 ANS: 2



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

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

213 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

214 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

215 ANS: 3

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

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

216 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

217 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

218 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

219 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

220 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

221 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

222 ANS: 2

$4(4x-3) = 3(2x+8)$

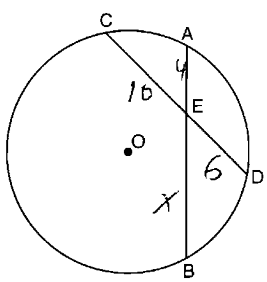
$16x - 12 = 6x + 24$

$10x = 36$

$x = 3.6$

PTS: 2 REF: 080923ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

223 ANS: 1



$4x = 6 \cdot 10$

$x = 15$

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

224 ANS:

$$x^2 = 9 \cdot 8$$
$$x = \sqrt{72}$$
$$x = \sqrt{36}\sqrt{2}$$
$$x = 6\sqrt{2}$$

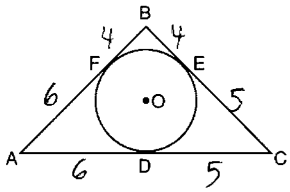
PTS: 2 REF: 011132ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

225 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

226 ANS: 3



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

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

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

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

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

231 ANS: 1

$M_x = \dfrac{-2+6}{2} = 2$. $M_y = \dfrac{3+3}{2} = 3$. 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

232 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: 2 REF: 061037ge STA: G.G.71 TOP: Equations of Circles

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

234 ANS: 4

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

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

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

236 ANS:

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

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

237 ANS:

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

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

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

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

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

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

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

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

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

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

246 ANS:

4. $l_1 w_1 h_1 = l_2 w_2 h_2$

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

$20 = 5w_2$

$w_2 = 4$

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

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

248 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

249 ANS:

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

$h \approx 9.1$

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

250 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

251 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

252 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

253 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

254 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

255 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

256 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

257 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

258 ANS:

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

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

259 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

260 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

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

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

262 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

263 ANS: 4
Corresponding angles of similar triangles are congruent.

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

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

265 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

266 ANS: 4
$180 - (50 + 30) = 100$

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

267 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

268 ANS:
20. $5x + 10 = 4x + 30$

$x = 20$

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

269 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: 2 REF: 081137ge STA: G.G.45 TOP: Similarity
KEY: basic

270 ANS: 1

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

$$3.6 = x$$

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

271 ANS: 4

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

$$x = 4$$

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

272 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

273 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

274 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

275 ANS:

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

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

$h = \sqrt{5.76} = 2.4$

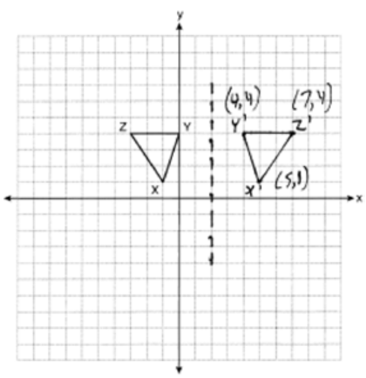
PTS: 4 REF: 081037ge STA: G.G.47 TOP: Similarity
KEY: altitude

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

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

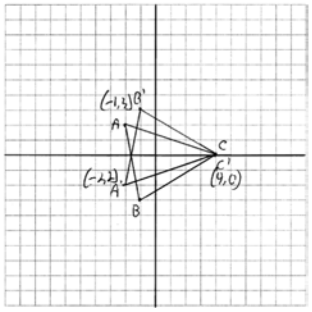
278 ANS: 1 PTS: 2 REF: 081113ge STA: G.G.54
TOP: Reflections KEY: basic

279 ANS:



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

280 ANS:



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

281 ANS: 3

$-5+3=-2 \qquad 2+-4=-2$

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

282 ANS: 1

$(x,y) \rightarrow (x+3, y+1)$

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

283 ANS: 1

$A'(2,4)$

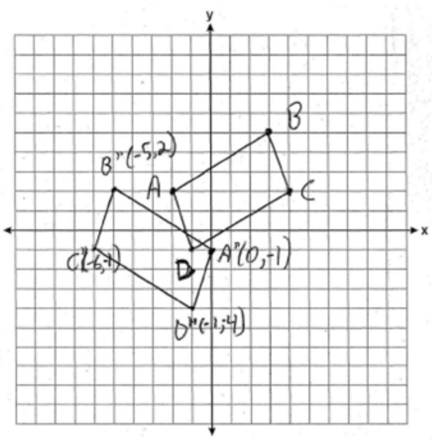
PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

284 ANS: 3

$(3,-2) \rightarrow (2,3) \rightarrow (8,12)$

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

285 ANS:

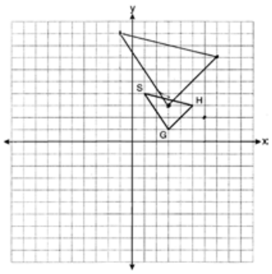


PTS: 4 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

286 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

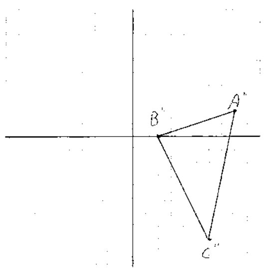
287 ANS:



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

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

288 ANS:



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

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

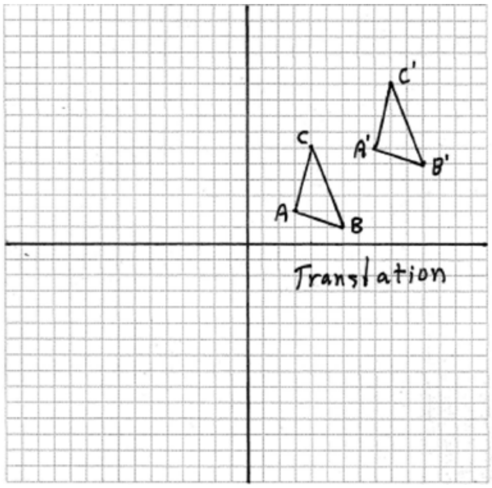
289 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

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

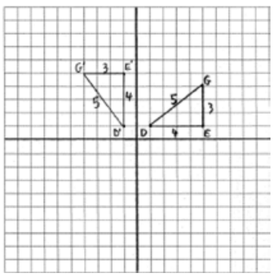
291 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.55
TOP: Properties of Transformations

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

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

294 ANS:


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

295 ANS:

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

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

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

297 ANS: 1
Translations and reflections do not affect distance.

PTS: 2 REF: 080908ge STA: G.G.59 TOP: Properties of Transformations

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

299 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

300 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations

301 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations

302 ANS: 4 PTS: 2 REF: 061018ge STA: G.G.56
TOP: Identifying Transformations

303 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
TOP: Identifying Transformations

304 ANS:
Yes. A reflection is an isometry.

PTS: 2 REF: 061132ge STA: G.G.56 TOP: Identifying Transformations

305 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Identifying Transformations

306 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations

307 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations

308 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations

309 ANS: 2
A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations

310 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations

311 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

312 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

313 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations

314 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations

315 ANS:
The medians of a triangle are not concurrent. False.

PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations

316 ANS: 4 PTS: 2 REF: 011118ge STA: G.G.25
TOP: Compound Statements KEY: general

317 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction

318 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

319 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements

320 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse and Biconditional

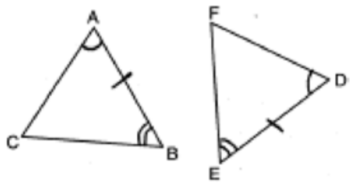
321 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements

322 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26
TOP: Contrapositive

323 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

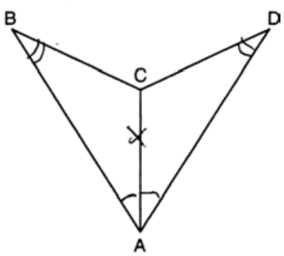
324 ANS: 3



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

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

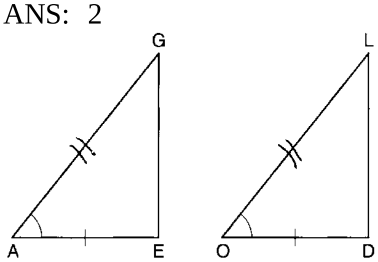
326 ANS: 4



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

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

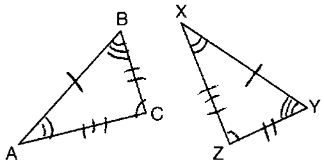
328 ANS: 2



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

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

330 ANS: 4



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

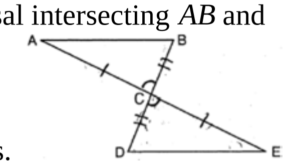
331 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency

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

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

334 ANS:

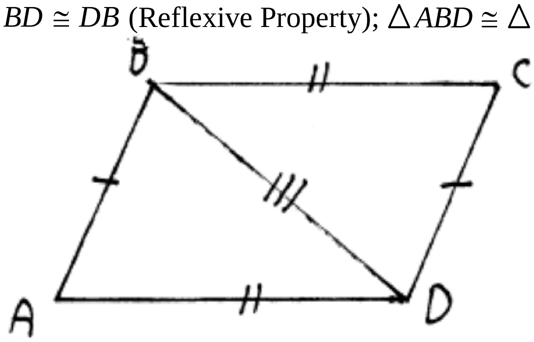
$\overline{AC} \cong \overline{EC}$ and $\overline{DC} \cong \overline{BC}$ because of the definition of midpoint. $\angle ACB \cong \angle ECD$ because of vertical angles. $\triangle ABC \cong \triangle EDC$ because of SAS. $\angle CDE \cong \angle CBA$ because of CPCTC. $\overline{BD}$ is a transversal intersecting $\overline{AB}$ and $\overline{ED}$. Therefore $\overline{AB} \parallel \overline{DE}$ because $\angle CDE$ and $\angle CBA$ are congruent alternate interior angles.



PTS: 6 REF: 060938ge STA: G.G.27 TOP: Triangle Proofs

335 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

336 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.

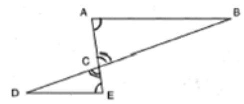
PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

337 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: 5 REF: 061138ge STA: G.G.27 TOP: Circle Proofs

338 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

339 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

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

341 ANS:
$\angle B$ and $\angle E$ are right angles because of the definition of perpendicular lines. $\angle B \cong \angle E$ because all right angles are congruent. $\angle BFD$ and $\angle DFE$ are supplementary and $\angle ECA$ and $\angle ACB$ are supplementary because of the definition of supplementary angles. $\angle DFE \cong \angle ACB$ because angles supplementary to congruent angles are congruent. $\triangle ABC \sim \triangle DEF$ because of AA.

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

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

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