JMAP
REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Geometry Regents Exam Questions
from Fall 2008 to August 2015 Sorted by PI: Topic

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Geometry Regents Exam Questions by Performance Indicator: Topic

LINEAR EQUATIONS

G.G.62: PARALLEL AND PERPENDICULAR LINES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

G.G.63: PARALLEL AND PERPENDICULAR LINES

15 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

16 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 $3y = -2x + 12$

17 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 $y - 2x = 3$

18 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 $2y + 10x = 8$

19 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

20 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

21 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°.

22 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

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

24 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.

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

26 Points $A(5,3)$ and $B(7,6)$ lie on $\overleftrightarrow{AB}$. Points $C(6,4)$ and $D(9,0)$ lie on $\overleftrightarrow{CD}$. Which statement is true?
1 $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$
2 $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$
3 $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are the same line.
4 $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect, but are not perpendicular.

27 A student wrote the following equations:

$$3y + 6 = 2x$$

$$2y - 3x = 6$$

The lines represented by these equations are
1 parallel
2 the same line
3 perpendicular
4 intersecting, but *not* perpendicular

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

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

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

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

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

Which statement is true?
1 $p \perp m$
2 $m \perp k$
3 $k \parallel p$
4 $m \parallel k$

30 The lines represented by the equations $4x + 6y = 6$ and $y = \frac{2}{3}x - 1$ are
1 parallel
2 the same line
3 perpendicular
4 intersecting, but *not* perpendicular

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

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

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

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

Which statement is true?
1 $k \parallel m$
2 $n \parallel m$
3 $m \perp k$
4 $m \perp n$

G.G.64: PARALLEL AND PERPENDICULAR LINES

32 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 $y = -2x - 9$

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

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

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

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

37 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 $y = -2x - 5$

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

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

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

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

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

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

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

2 $y = -3x - 15$

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

4 $y = -3x + 27$

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

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

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

3 $y = 2x - 6$

4 $y = 2x$

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

G.G.65: PARALLEL AND PERPENDICULAR LINES

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

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

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

45 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 $y = -2x + 17$

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

47 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 $3x + 4y = 14$

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

49 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 $y = 2x - 1$

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

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

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

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

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

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

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

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

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

2 $y = -5x + 28$

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

4 $y = -5x - 28$

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

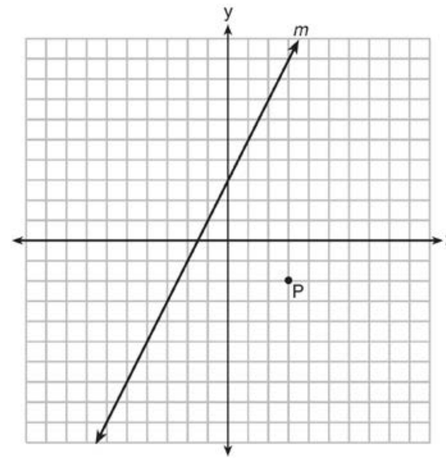
1 $y = \frac{1}{2}x - 3$

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

3 $y = -2x + 7$

4 $y = -2x + 2$

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



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

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

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

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

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

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

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

1 $2y + 3x = 11$

2 $2y + 3x = 22$

3 $3y - 2x = 2$

4 $3y - 2x = 7$

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

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

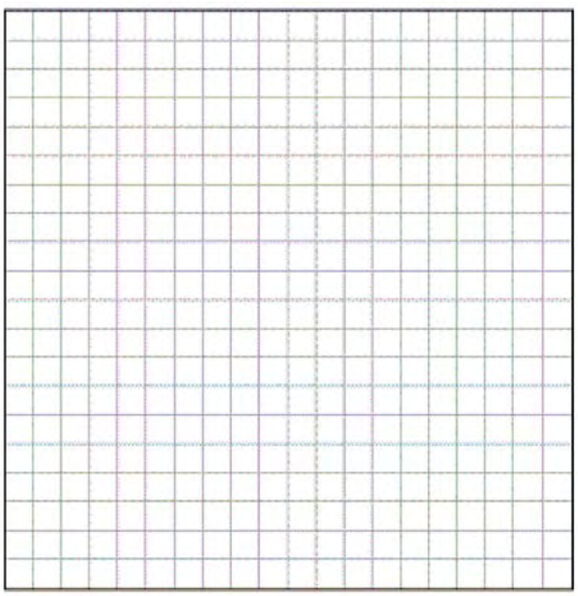
2 $y=\frac{1}{2}x-2$

3 $y=2x+5$

4 $y=2x-5$

G.G.68: PERPENDICULAR BISECTOR

59 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]



60 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 $y=2x-12$

61 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

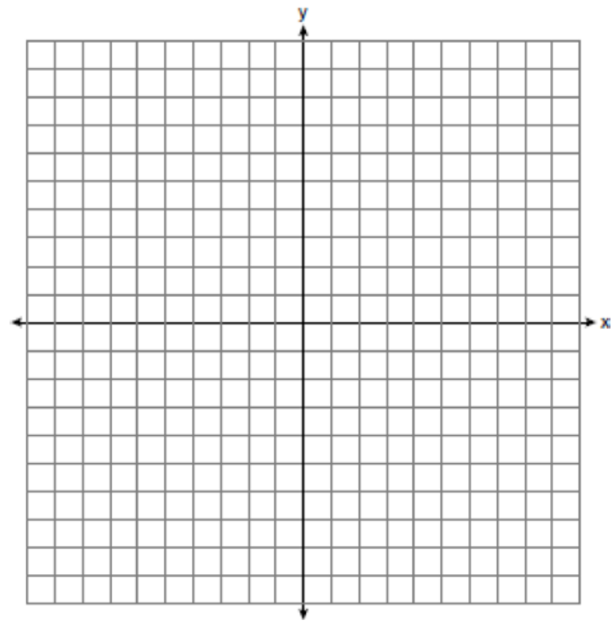
1 $x=0$

2 $x=3$

3 $y=0$

4 $y=3$

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



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

1 $y=2x-6$

2 $y=-2x+4$

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

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

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

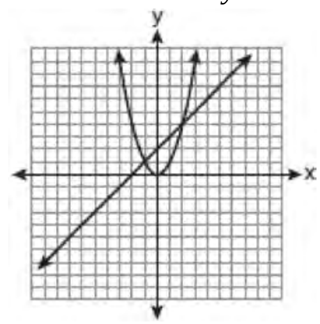
SYSTEMS

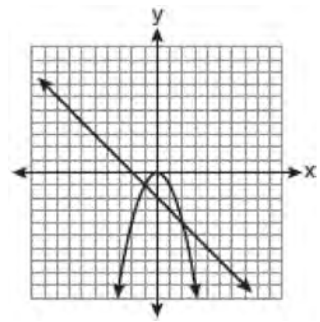
G.G.70: QUADRATIC-LINEAR SYSTEMS

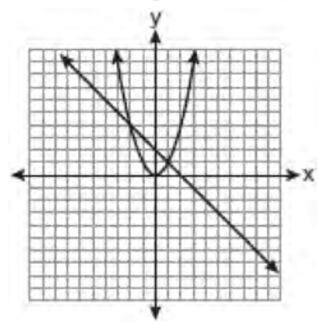
65 Which graph could be used to find the solution to the following system of equations?

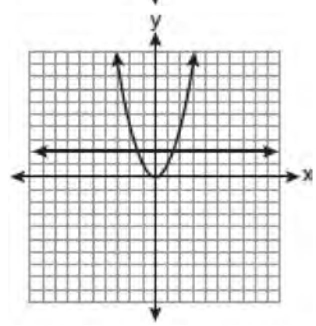
$$y = -x + 2$$

$$y = x^2$$

1 

2 

3 

4 

66 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

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

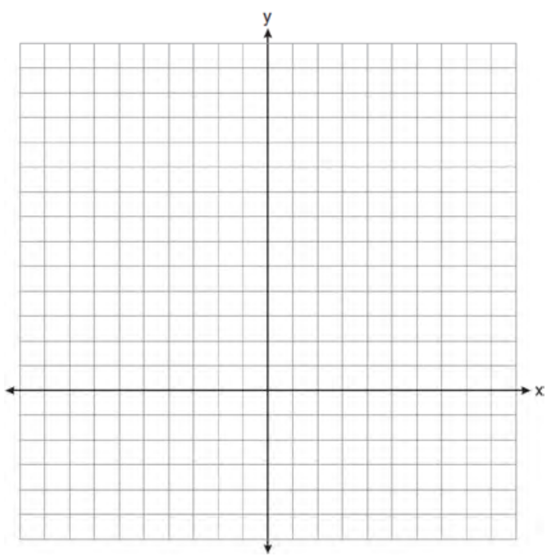
$$y + x = 4$$

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 $(3,1)$

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

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

$$4x + 2y = 14$$



69 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

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

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

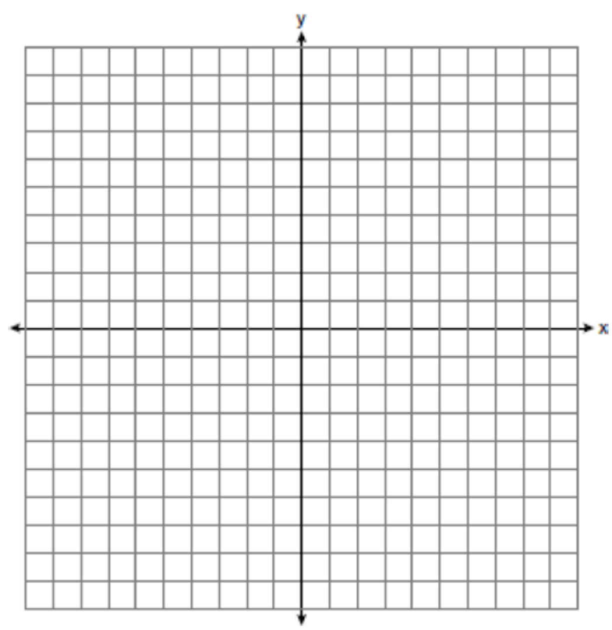
$$y = 2x + 5$$

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

71 Solve the following system of equations graphically.

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

$$x + y = 1$$



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

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

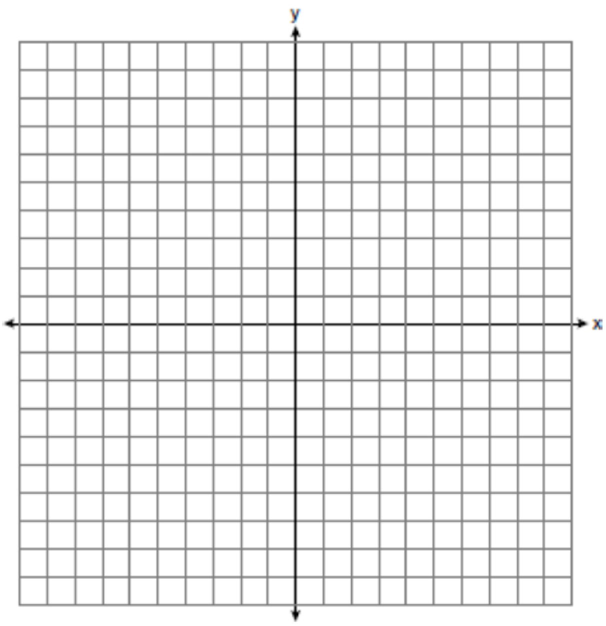
$$y = x + 2$$

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

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

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

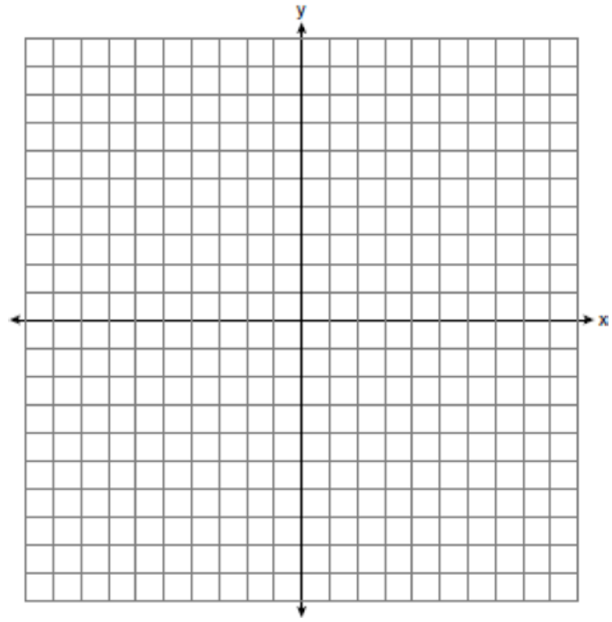
$$2y + 16 = 4x$$



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

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

$$2y + 4 = -x$$



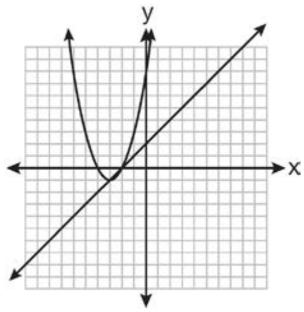
75 The equations $x^2 + y^2 = 25$ and $y = 5$ are graphed on a set of axes. What is the solution of this system?

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

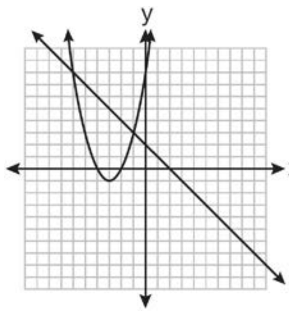
76 Which graph could be used to find the solution to the following system of equations?

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

$$x + y = 2$$



1



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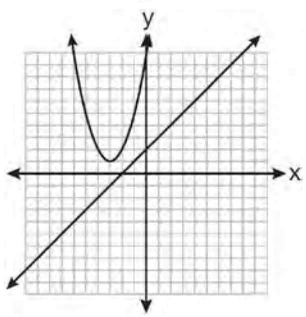

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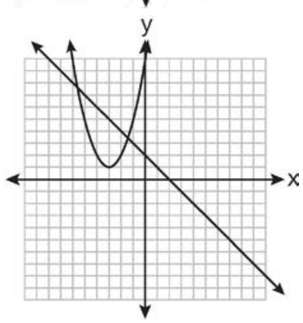


4

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

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

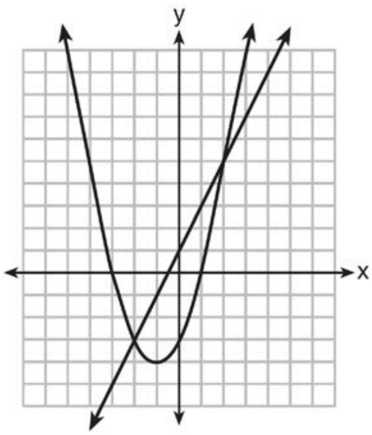
79 When the system of equations $y + 2x = x^2$ and $y = x$ is graphed on a set of axes, what is the total number of points of intersection?
1 1
2 2
3 3
4 0

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

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

$$y = 2x + 1$$

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

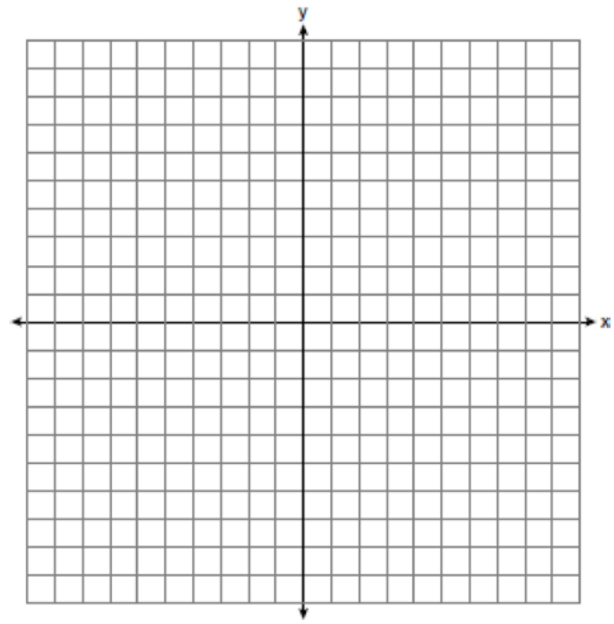


1 $(0,-3)$
2 $(-1,-4)$
3 $(-3,0)$ and $(1,0)$
4 $(-2,-3)$ and $(2,5)$

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

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

$$x + y = 5$$



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

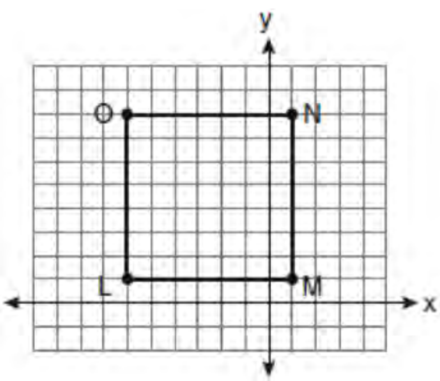
TOOLS OF GEOMETRY

G.G.66: MIDPOINT

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

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



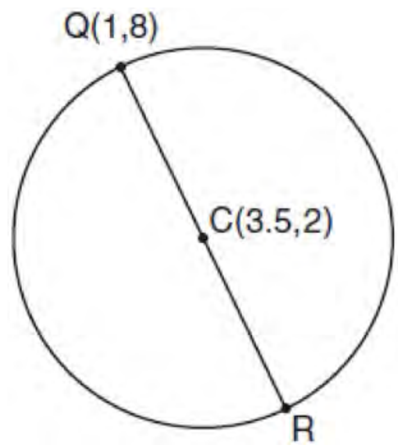
What are the coordinates of the midpoint of diagonal $\overline{LN}$?

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

86 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 $(4,3)$

87 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.



88 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 $(4x+4,2y)$

89 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 $(5,-2)$

90 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.

91 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 $(-5,2)$

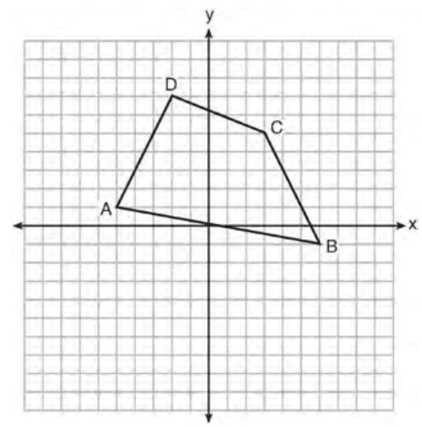
92 Point M is the midpoint of $\overline{AB}$. If the coordinates of A are $(-3,6)$ and the coordinates of M are $(-5,2)$, what are the coordinates of B?
1 $(1,2)$
2 $(7,10)$
3 $(-4,4)$
4 $(-7,-2)$

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

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

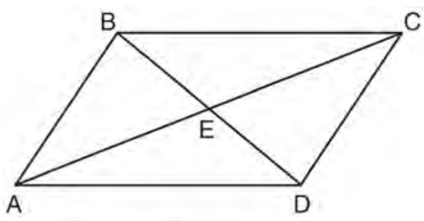
95 The midpoint of $\overline{AB}$ is $M(4,2)$. If the coordinates of A are $(6,-4)$, what are the coordinates of B?
1 $(1,-3)$
2 $(2,8)$
3 $(5,-1)$
4 $(14,0)$

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



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

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



(Not drawn to scale)

What are the coordinates of point E?

1 $(0.5,2)$
2 $(4.5,2)$
3 $(5.5,5)$
4 $(7.5,7)$

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

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

99 Point M is the midpoint of $\overline{AB}$. If the coordinates of M are $(2,8)$ and the coordinates of A are $(10,12)$, what are the coordinates of B?

1 $(6,10)$
2 $(-6,4)$
3 $(-8,-4)$
4 $(18,16)$

G.G.67: DISTANCE

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

101 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

102 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 $2\sqrt{5}$

103 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

104 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 $\sqrt{145}$

105 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 $2\sqrt{41}$

106 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 $\sqrt{233}$

107 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 $2\sqrt{26}$

108 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

109 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 $\sqrt{50}$

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

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

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

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

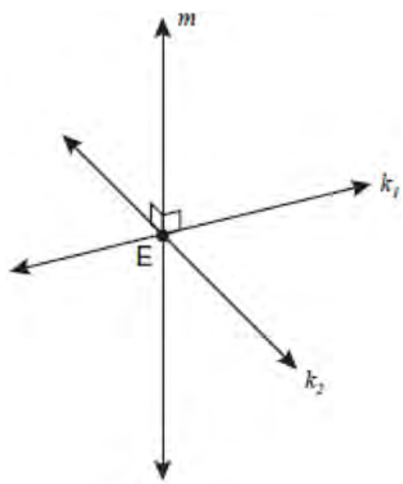
114 Line segment AB has endpoint A located at the origin. Line segment AB is longest when the coordinates of B are
1 $(3,7)$
2 $(2,-8)$
3 $(-6,4)$
4 $(-5,-5)$

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

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

G.G.1: PLANES

117 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.

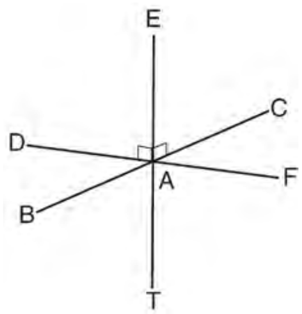
118 Lines j and k intersect at point P. Line m is drawn so that it is perpendicular to lines j and k at point P. Which statement is correct?
1 Lines j and k are in perpendicular planes.
2 Line m is in the same plane as lines j and k.
3 Line m is parallel to the plane containing lines j and k.
4 Line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

119 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 $\mathcal{P}$

120 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.

121 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.

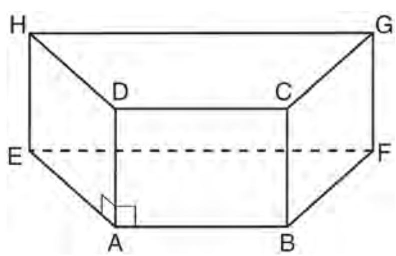
122 As shown in the diagram below, $\overline{FD}$ and $\overline{CB}$ intersect at point A and $\overline{ET}$ is perpendicular to both $\overline{FD}$ and $\overline{CB}$ at A.



Which statement is *not* true?

1 $\overline{ET}$ is perpendicular to plane BAD.
2 $\overline{ET}$ is perpendicular to plane FAB.
3 $\overline{ET}$ is perpendicular to plane CAD.
4 $\overline{ET}$ is perpendicular to plane BAT.

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



Which plane is perpendicular to $\overline{AD}$?

1 HEA
2 BAD
3 EAB
4 EHG

G.G.2: PLANES

124 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

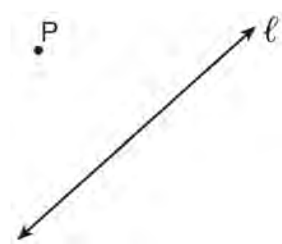
125 Point P lies on line m. Point P is also included in distinct planes $\mathcal{Q}$, $\mathcal{R}$, $\mathcal{S}$, and $\mathcal{T}$. At most, how many of these planes could be perpendicular to line m?

1 1
2 2
3 3
4 4

126 Point A is on line m. How many distinct planes will be perpendicular to line m and pass through point A?

1 one
2 two
3 zero
4 infinite

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



How many distinct planes that contain point P are also perpendicular to line ℓ?

1 1
2 2
3 0
4 an infinite amount

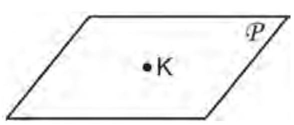
G.G.3: PLANES

128 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

129 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

130 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

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



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

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

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

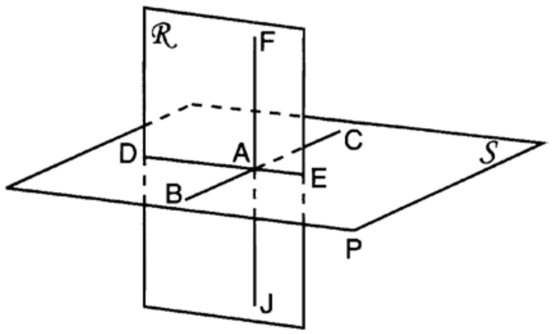
G.G.4: PLANES

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

G.G.5: PLANES

135 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 $\mathcal{R}$.

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

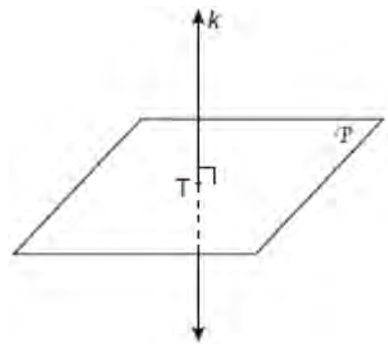


Which fact is sufficient to show that planes $\mathcal{R}$ and $\mathcal{S}$ are perpendicular?

1 $\overline{FA} \perp \overline{DE}$
2 $\overline{AD} \perp \overline{AF}$
3 $\overline{BC} \perp \overline{FJ}$
4 $\overline{DE} \perp \overline{BC}$

G.G.7: PLANES

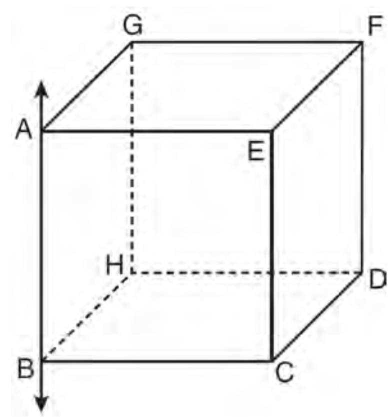
137 In the diagram below, line k is perpendicular to plane $\mathcal{P}$ at point T.



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 $\mathcal{P}$.

138 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

139 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

140 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

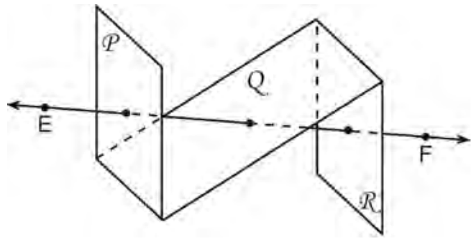
141 Line *k* is drawn so that it is perpendicular to two distinct planes, *P* and *R*. What must be true about planes *P* and *R*?
1 Planes *P* and *R* are skew.
2 Planes *P* and *R* are parallel.
3 Planes *P* and *R* are perpendicular.
4 Plane *P* intersects plane *R* but is not perpendicular to plane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

142 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

143 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 $\mathcal{D}$.

144 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*.

145 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 $\mathcal{P}$.

146 Plane $\mathcal{A}$ and plane $\mathcal{B}$ are two distinct planes that are both perpendicular to line ℓ. Which statement about planes $\mathcal{A}$ and $\mathcal{B}$ is true?

1 Planes $\mathcal{A}$ and $\mathcal{B}$ have a common edge, which forms a line.
2 Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
3 Planes $\mathcal{A}$ and $\mathcal{B}$ intersect each other at exactly one point.
4 Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.

147 If line ℓ is perpendicular to distinct planes $\mathcal{P}$ and $\mathcal{Q}$, then planes $\mathcal{P}$ and $\mathcal{Q}$

1 are parallel
2 contain line ℓ
3 are perpendicular
4 intersect, but are *not* perpendicular

148 If distinct planes $\mathcal{R}$ and $\mathcal{S}$ are both perpendicular to line ℓ, which statement must always be true?

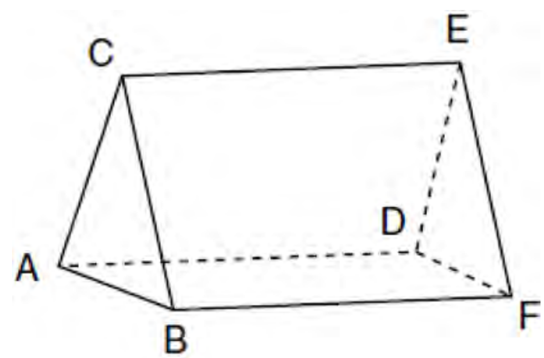
1 Plane $\mathcal{R}$ is parallel to plane $\mathcal{S}$.
2 Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{S}$.
3 Planes $\mathcal{R}$ and $\mathcal{S}$ and line ℓ are all parallel.
4 The intersection of planes $\mathcal{R}$ and $\mathcal{S}$ is perpendicular to line ℓ.

149 Plane $\mathcal{P}$ is parallel to plane $\mathcal{Q}$. If plane $\mathcal{P}$ is perpendicular to line ℓ, then plane $\mathcal{Q}$

1 contains line ℓ
2 is parallel to line ℓ
3 is perpendicular to line ℓ
4 intersects, but is not perpendicular to line ℓ

G.G.10: SOLIDS

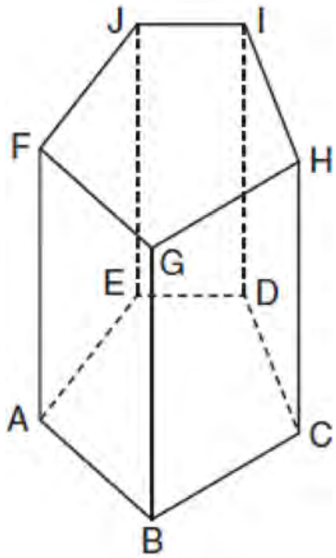
150 The figure in the diagram below is a triangular prism.



Which statement must be true?

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

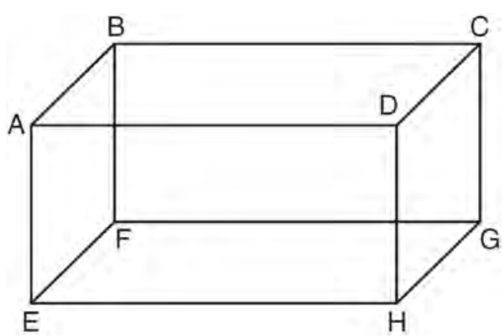
151 The diagram below shows a right pentagonal prism.



Which statement is always true?

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

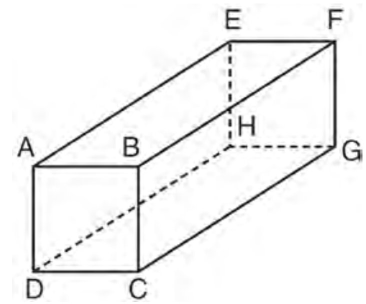
152 The diagram below shows a rectangular prism.



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 $\overline{EF}$

153 The diagram below represents a rectangular solid.



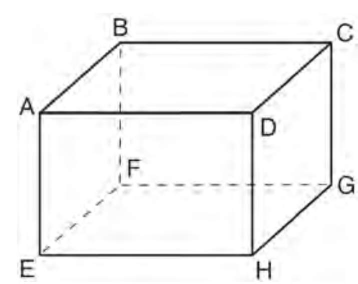
Which statement must be true?

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

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

1 10
2 12
3 14
4 16

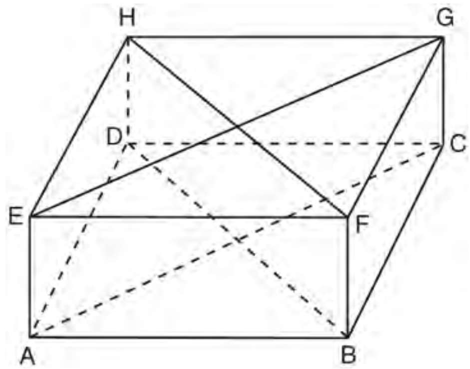
155 A rectangular right prism is shown in the diagram below.



Which pair of edges are *not* coplanar?

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

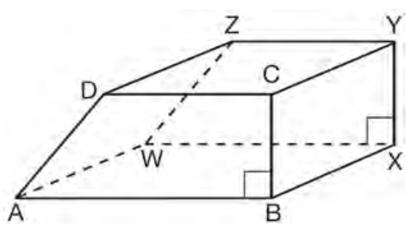
156 A rectangular prism is shown in the diagram below.



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

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

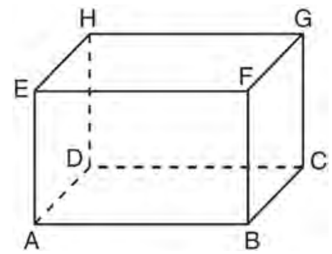
157 The bases of a prism are right trapezoids, as shown in the diagram below.



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

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

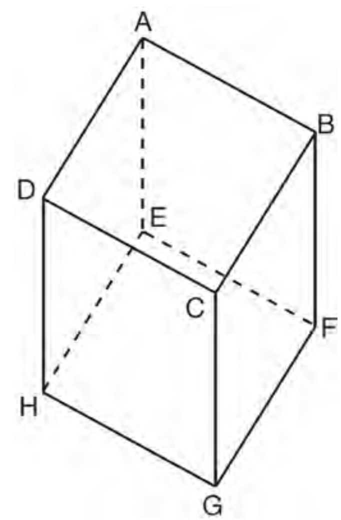
158 A right rectangular prism is shown in the diagram below.



Which line segments are coplanar?

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

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

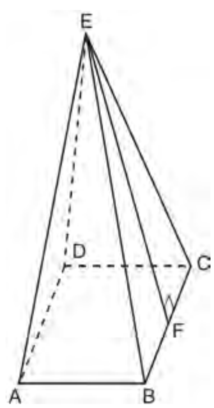


1 $\overline{EH}$ and $\overline{CD}$
2 $\overline{AD}$ and $\overline{FG}$
3 $\overline{DH}$ and $\overline{AE}$
4 $\overline{AB}$ and $\overline{EF}$

G.G.13: SOLIDS

160 The lateral faces of a regular pyramid are composed of
1 squares
2 rectangles
3 congruent right triangles
4 congruent isosceles triangles

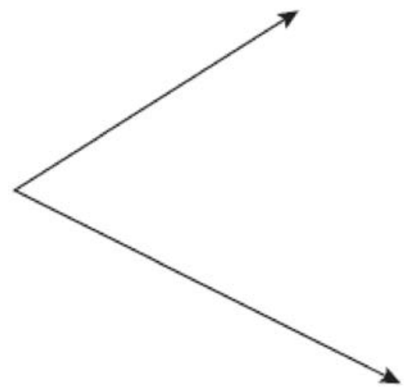
161 As shown in the diagram below, a right pyramid has a square base, $ABCD$, and $\overline{EF}$ is the slant height.



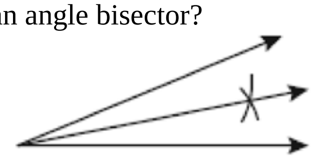
Which statement is *not* true?
1 $\overline{EA} \cong \overline{EC}$
2 $\overline{EB} \cong \overline{EF}$
3 $\triangle AEB \cong \triangle BEC$
4 $\triangle CED$ is isosceles

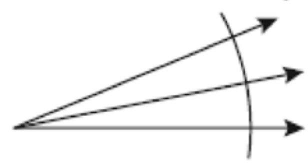
G.G.17: CONSTRUCTIONS

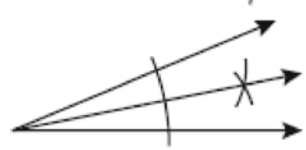
162 Using a compass and straightedge, construct the bisector of the angle shown below. [*Leave all construction marks*.]

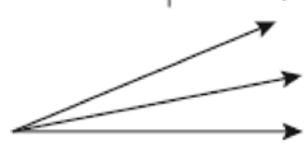


163 Which illustration shows the correct construction of an angle bisector?

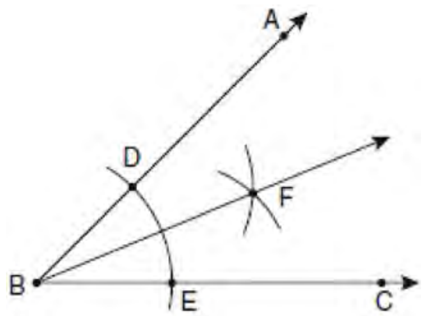
1


2


3


4


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



Which statement is *not* true?

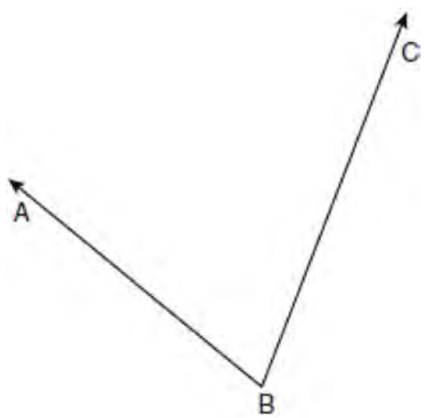
1 $m\angle EBF = \frac{1}{2}m\angle ABC$

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

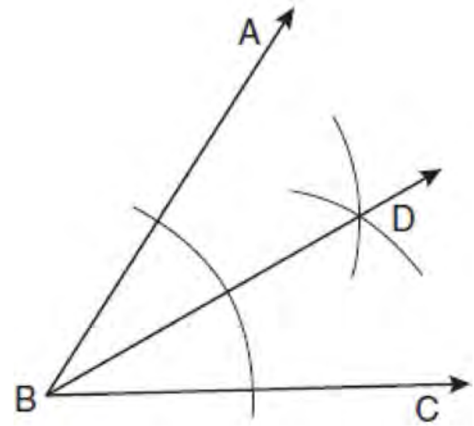
3 $m\angle EBF = m\angle ABC$

4 $m\angle DBF = m\angle EBF$

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



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



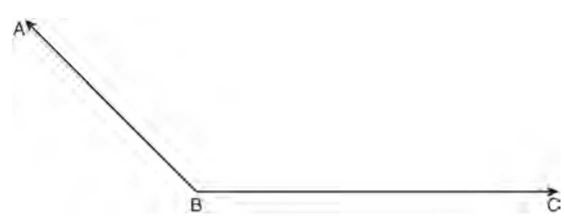
1 $m\angle ABD = \frac{1}{2}m\angle CBD$

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

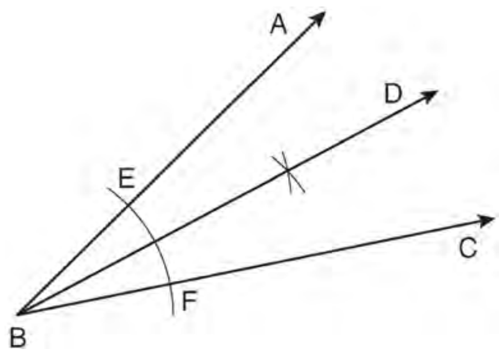
3 $m\angle ABD = m\angle ABC$

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

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



168 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*?

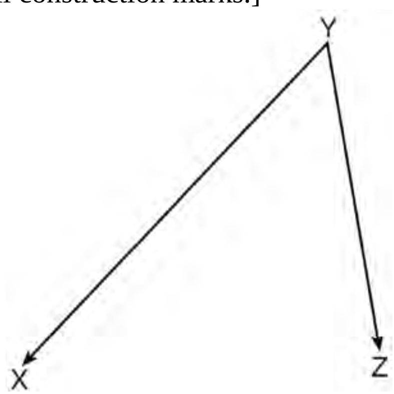
1 $m\angle ABD = m\angle DBC$

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

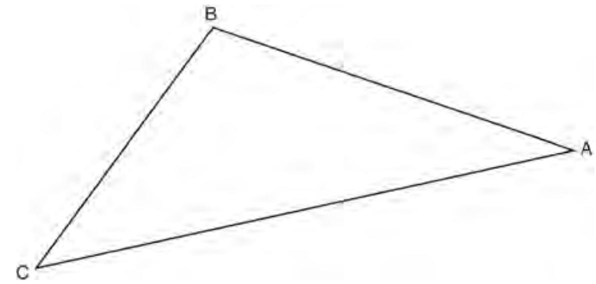
3 $2(m\angle DBC) = m\angle ABC$

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

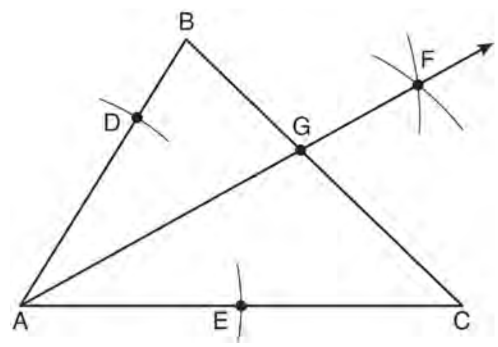
169 On the diagram below, use a compass and straightedge to construct the bisector of $\angle XYZ$. [Leave all construction marks.]



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



171 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?

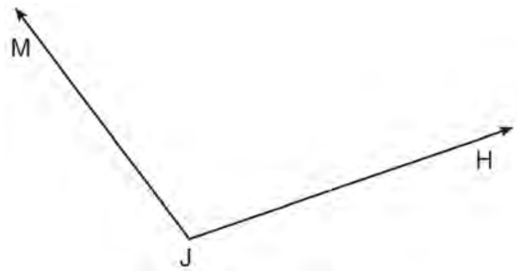
1 $\overrightarrow{AF}$ bisects side $\overline{BC}$

2 $\overrightarrow{AF}$ bisects $\angle BAC$

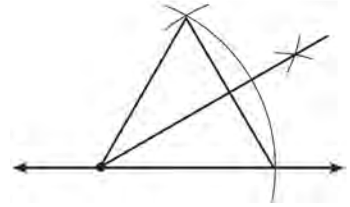
3 $\overrightarrow{AF} \perp \overline{BC}$

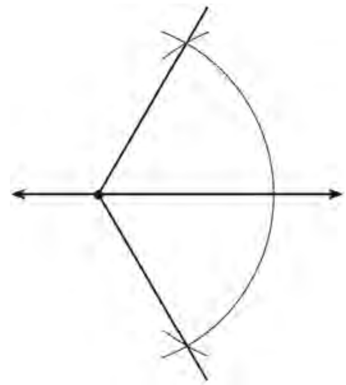
4 $\triangle ABG \sim \triangle ACG$

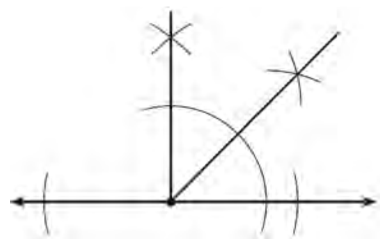
172 Using a compass and straightedge, construct the bisector of $\angle MJH$. [Leave all construction marks.]

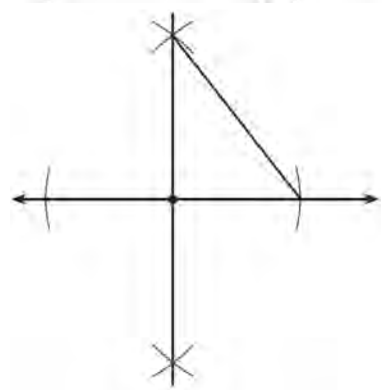


173 Which diagram shows the construction of a 45° angle?

1 

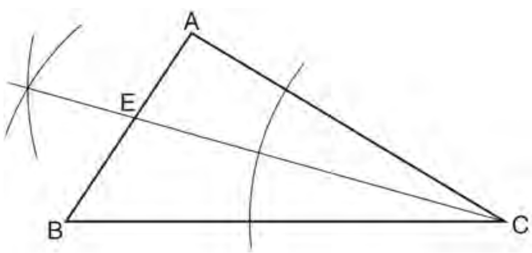
2 

3 

4 

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

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

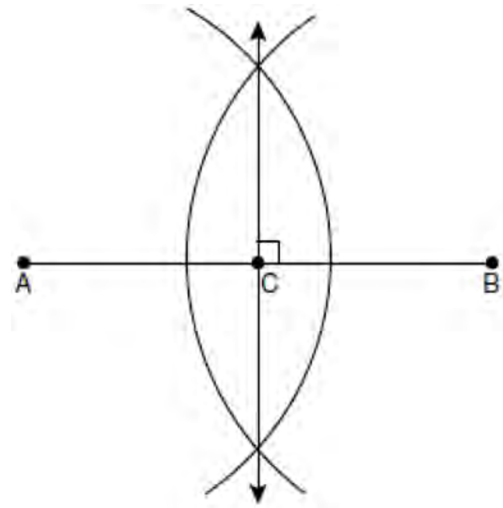


Which statement must always be true for this construction?

1 $\angle CEA \cong \angle CEB$
2 $\angle ACE \cong \angle BCE$
3 $\overline{AE} \cong \overline{BE}$
4 $\overline{EC} \cong \overline{AC}$

G.G.18: CONSTRUCTIONS

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



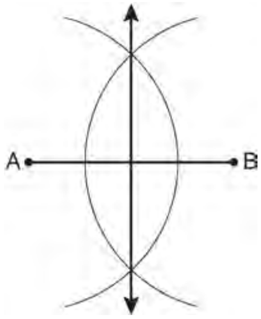
Which statement is *not* true?

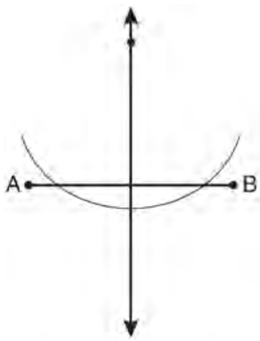
1 $AC = CB$
2 $CB = \frac{1}{2}AB$
3 $AC = 2AB$
4 $AC + CB = AB$

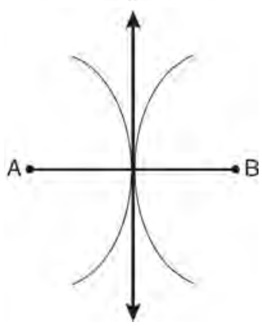
177 One step in a construction uses the endpoints of $\overline{AB}$ to create arcs with the same radii. The arcs intersect above and below the segment. What is the relationship of $\overline{AB}$ and the line connecting the points of intersection of these arcs?

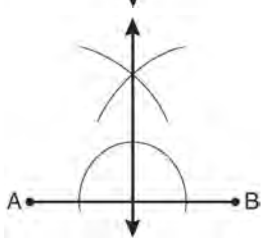
1 collinear
2 congruent
3 parallel
4 perpendicular

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

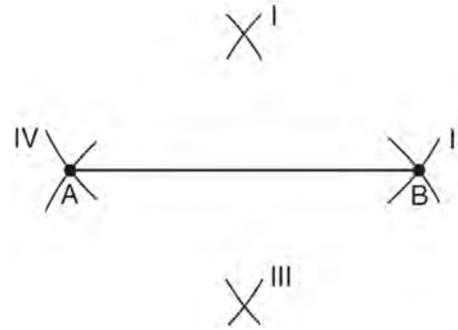
1 

2 

3 

4 

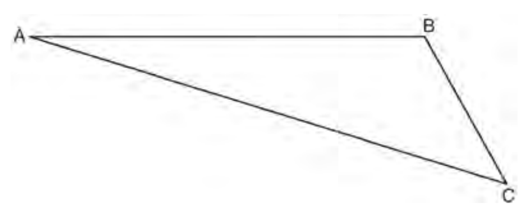
179 Line segment AB is shown in the diagram below.



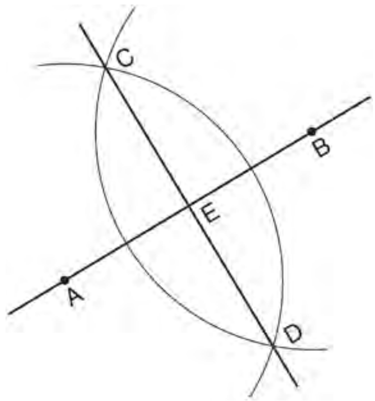
Which two sets of construction marks, labeled I, II, III, and IV, are part of the construction of the perpendicular bisector of line segment AB?

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

180 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.]

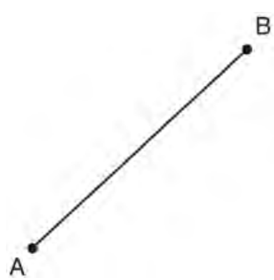


181 Based on the construction below, which conclusion is *not* always true?



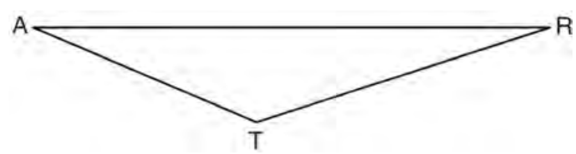
1 $\overline{AB} \perp \overline{CD}$
2 $AB = CD$
3 $AE = EB$
4 $CE = DE$

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

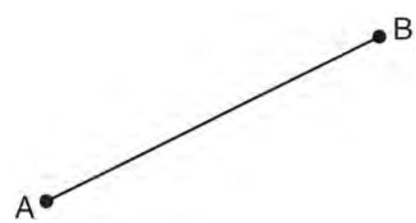


183 Use a compass and straightedge to divide line segment *AB* below into four congruent parts. [Leave all construction marks.]

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

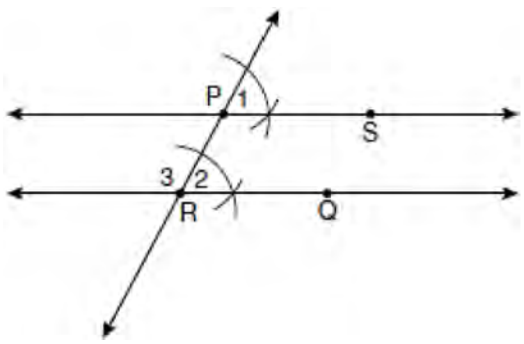


185 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction. [Leave all construction marks.]



G.G.19: CONSTRUCTIONS

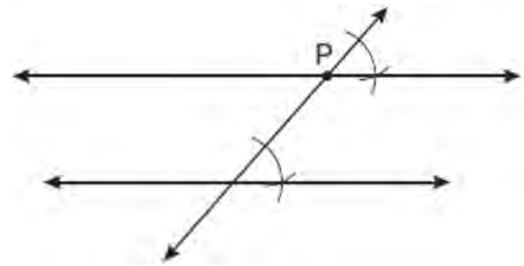
186 The diagram below illustrates the construction of $\overleftrightarrow{PS}$ parallel to $\overleftrightarrow{RQ}$ through point P.



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 $\overline{PS} \cong \overline{RQ}$

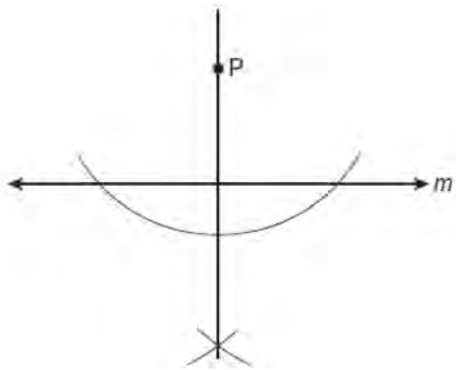
187 Using a compass and straightedge, construct a line that passes through point P and is perpendicular to line m. [Leave all construction marks.]

188 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.

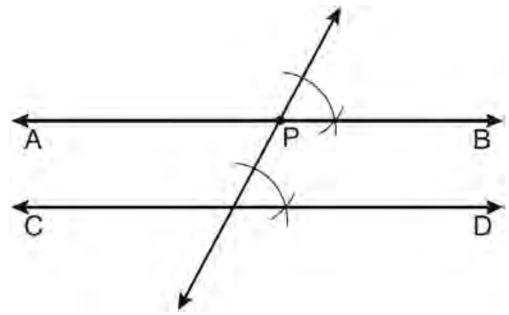
189 The diagram below shows the construction of a line through point *P* perpendicular to line *m*.



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.

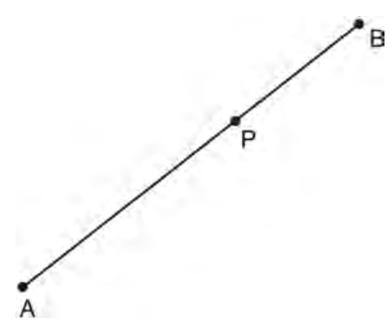
190 The diagram below shows the construction of $\overleftrightarrow{AB}$ through point *P* parallel to $\overleftrightarrow{CD}$.



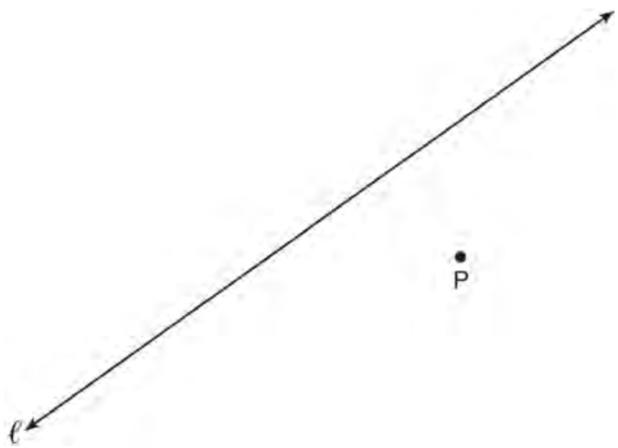
Which theorem justifies this method of construction?

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.

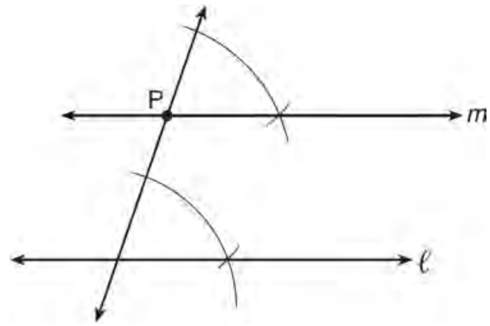
191 Using a compass and straightedge, construct a line perpendicular to $\overline{AB}$ through point *P*. [Leave all construction marks.]



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



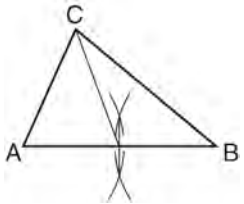
193 The diagram below shows the construction of line *m*, parallel to line ℓ, through point *P*.



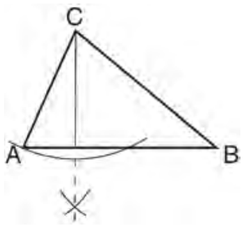
Which theorem was used to justify this construction?

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

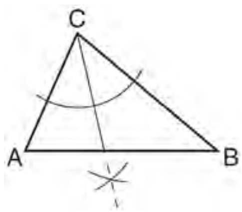
194 Which diagram illustrates a correct construction of an altitude of $\triangle ABC$?



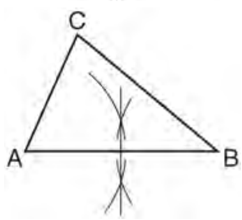
1



2

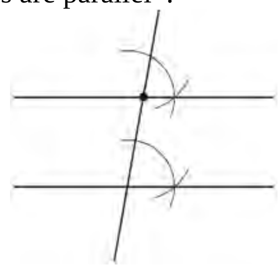


3

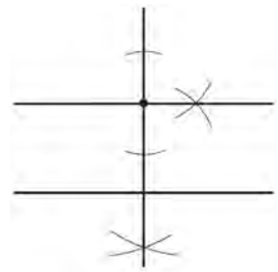


4

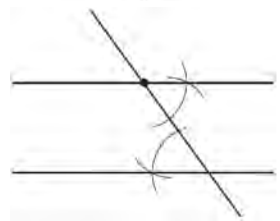
195 Which construction of parallel lines is justified by the theorem "If two lines are cut by a transversal to form congruent alternate interior angles, then the lines are parallel"?



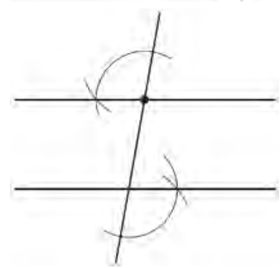
1



2



3

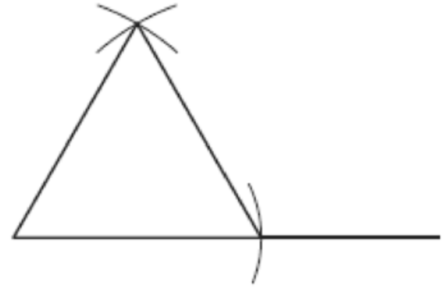


4

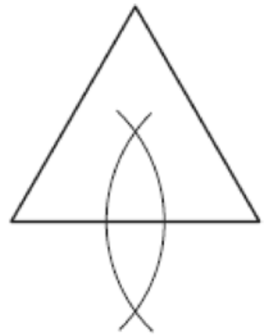
G.G.20: CONSTRUCTIONS

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

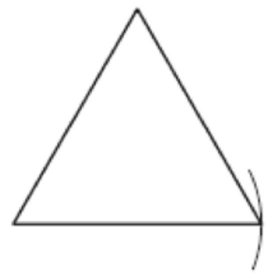
197 Which diagram shows the construction of an equilateral triangle?



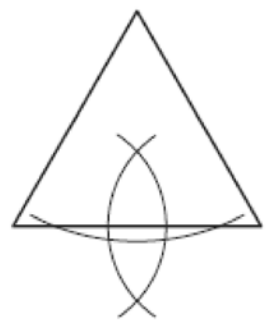
1



2



3

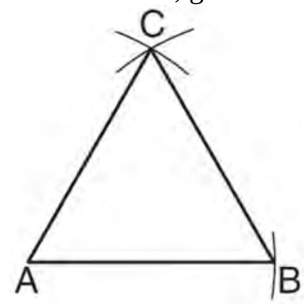


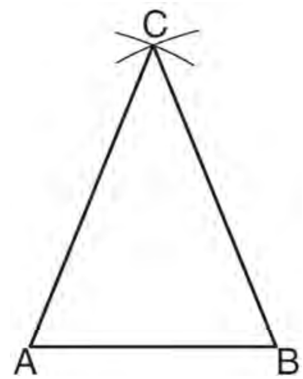
4

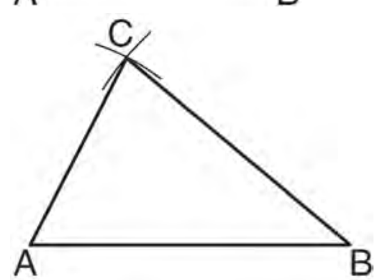
198 On the line segment below, use a compass and straightedge to construct equilateral triangle *ABC*. [Leave all construction marks.]

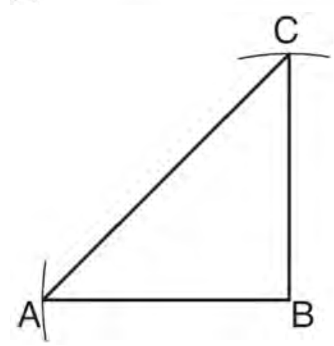
199 Using a compass and straightedge, on the diagram below of $\overleftrightarrow{RS}$, construct an equilateral triangle with $\overline{RS}$ as one side. [Leave all construction marks.]

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

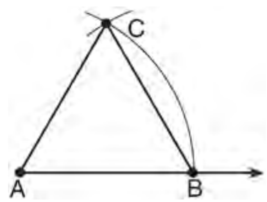
1 

2 

3 

4 

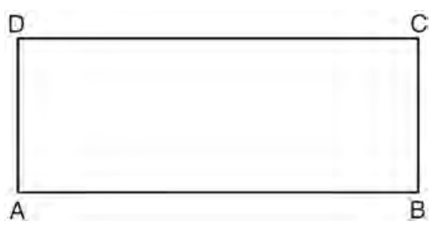
201 The diagram below shows the construction of an equilateral triangle.



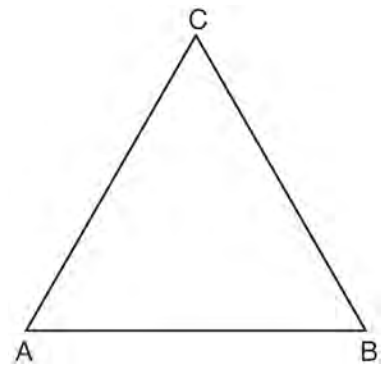
Which statement justifies this construction?

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

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



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



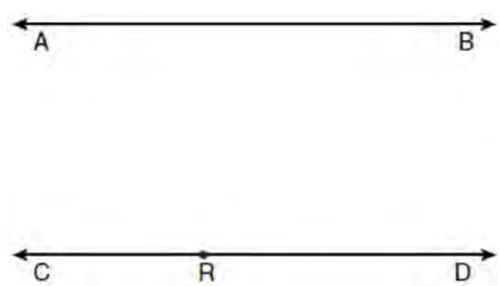
Using a compass and straightedge, construct a new equilateral triangle congruent to $\triangle ABC$ in the space below. [Leave all construction marks.]

G.G.22: LOCUS

204 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.

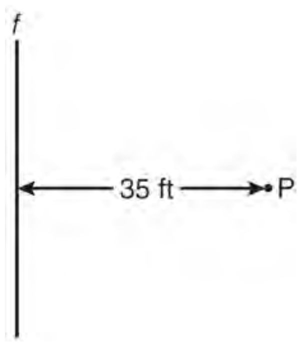
205 Towns A and B are 16 miles apart. How many points are 10 miles from town A and 12 miles from town B?
1 1
2 2
3 3
4 0

206 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.



207 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.

208 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.



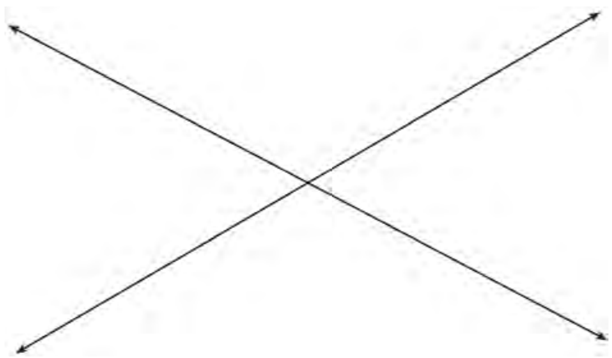
How many locations are possible for the bird bath?
1 1
2 2
3 3
4 0

209 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.

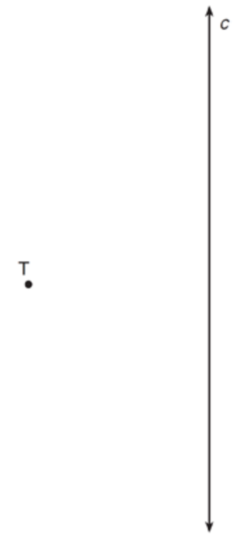
210 How many points are 5 units from a line and also equidistant from two points on the line?
1 1
2 2
3 3
4 0

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

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

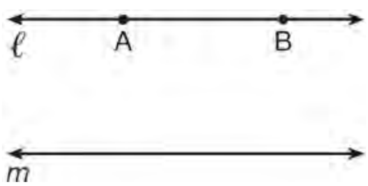


213 A tree, *T*, is 6 meters from a row of corn, *c*, as represented in the diagram below. A farmer wants to place a scarecrow 2 meters from the row of corn and also 5 meters from the tree. Sketch both loci. Indicate, with an **X**, all possible locations for the scarecrow.



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

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

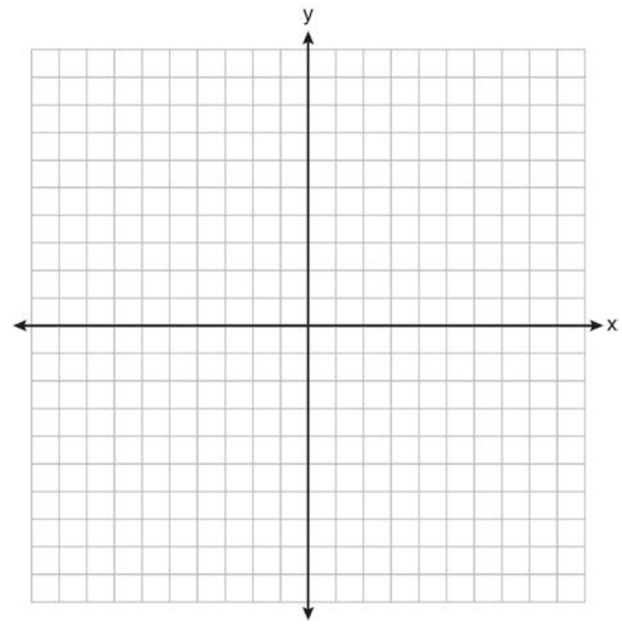


How many points are in the same plane as ℓ and m and equidistant from ℓ and m, and also equidistant from A and B?

1 1
2 2
3 3
4 0

G.G.23: LOCUS

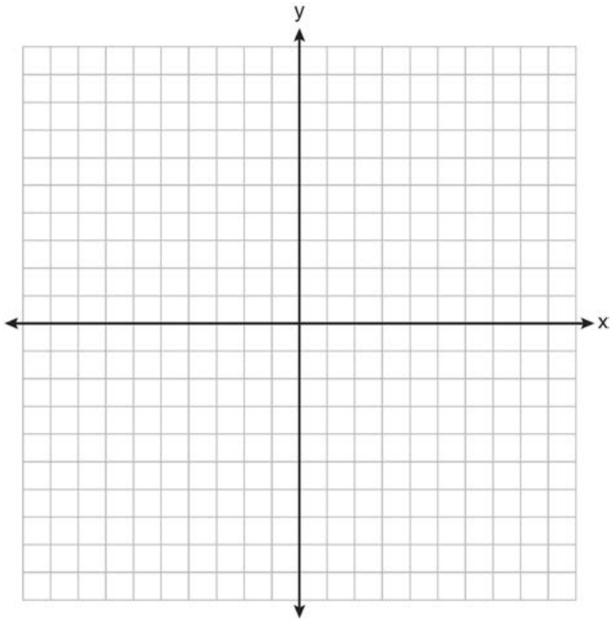
216 A city is planning to build a new park. The park must be equidistant from school A at $(3,3)$ and school B at $(3,-5)$. The park also must be exactly 5 miles from the center of town, which is located at the origin on the coordinate graph. Each unit on the graph represents 1 mile. On the set of axes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



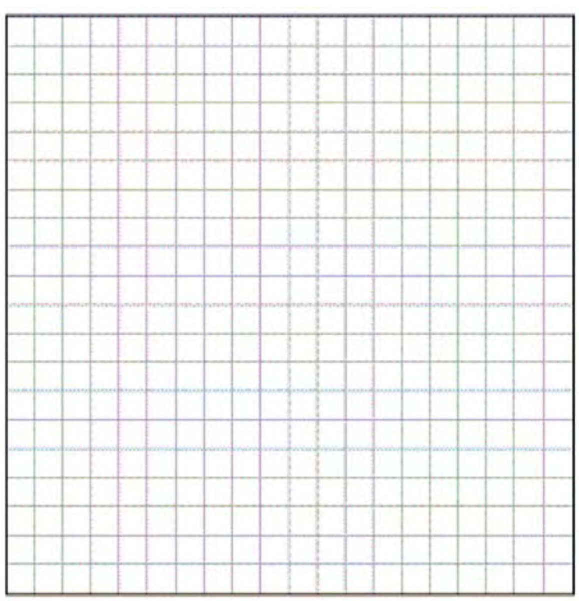
217 In a coordinate plane, how many points are both 5 units from the origin and 2 units from the x-axis?

1 1
2 2
3 3
4 4

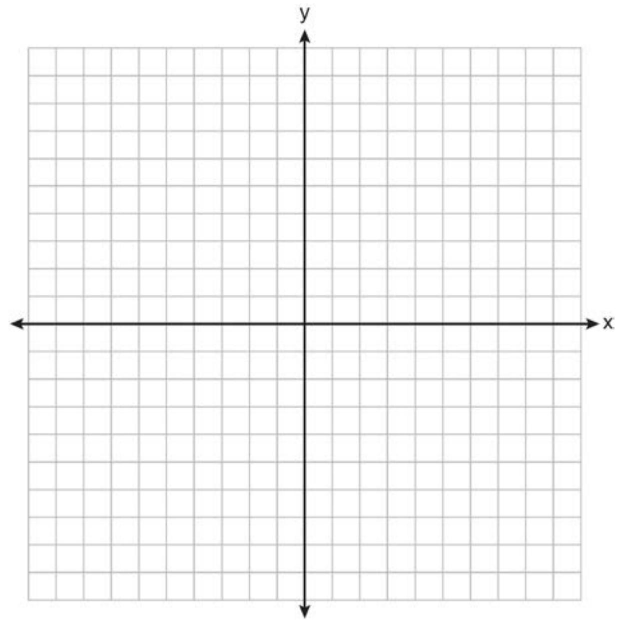
218 On the set of axes below, sketch the points that are 5 units from the origin and sketch the points that are 2 units from the line $y = 3$. Label with an **X** all points that satisfy both conditions.



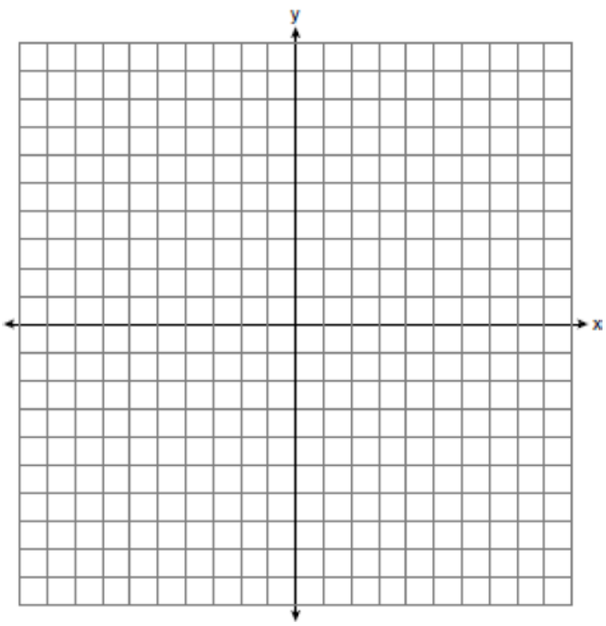
219 On the grid below, graph the points that are equidistant from both the x and y axes and the points that are 5 units from the origin. Label with an **X** all points that satisfy *both* conditions.



220 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.

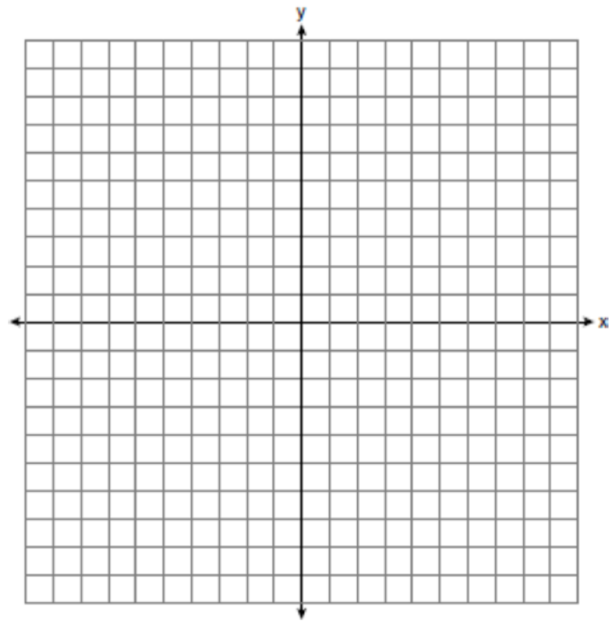


221 On the set of coordinate axes below, graph the locus of points that are equidistant from the lines $y = 6$ and $y = 2$ and also graph the locus of points that are 3 units from the y-axis. State the coordinates of *all* points that satisfy *both* conditions.

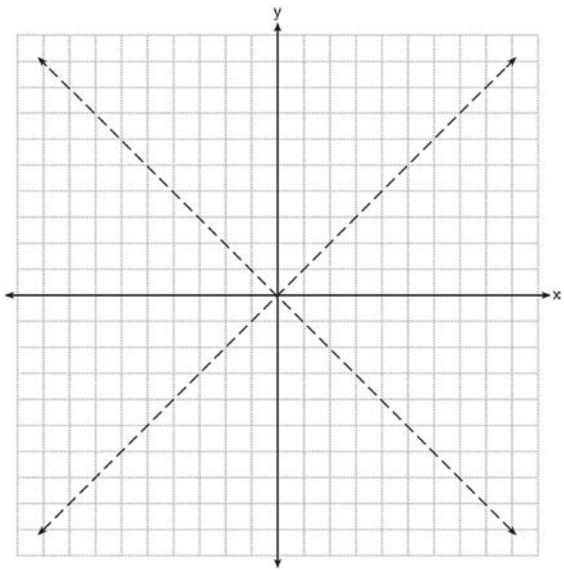


222 How many points are both 4 units from the origin and also 2 units from the line $y = 4$?
1 1
2 2
3 3
4 4

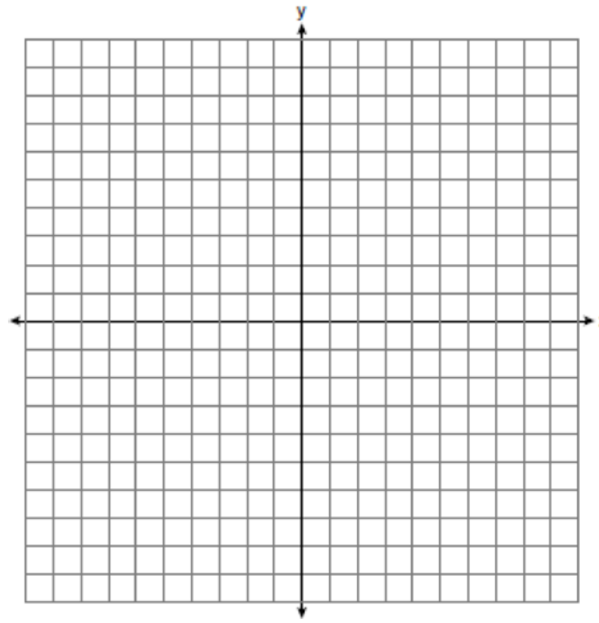
223 On the set of axes below, graph the locus of points that are 4 units from the line $x = 3$ and the locus of points that are 5 units from the point $(0,2)$. Label with an **X** all points that satisfy both conditions.



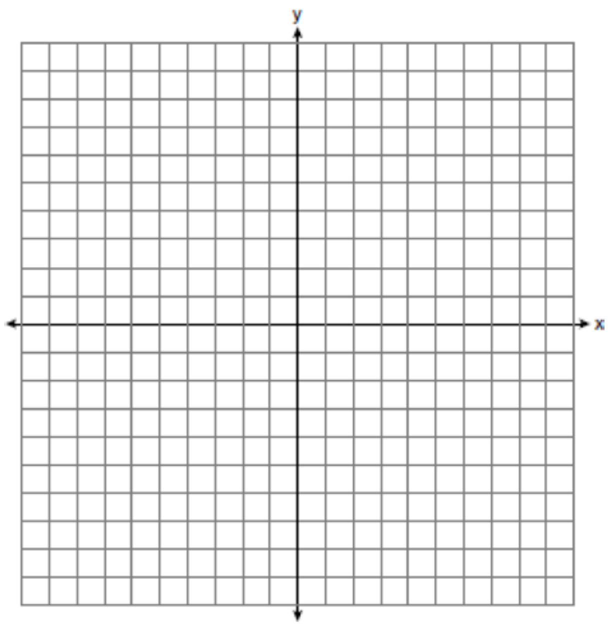
224 The graph below shows the locus of points equidistant from the x-axis and y-axis. On the same set of axes, graph the locus of points 3 units from the line $x = 0$. Label with an **X** *all* points that satisfy both conditions.



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



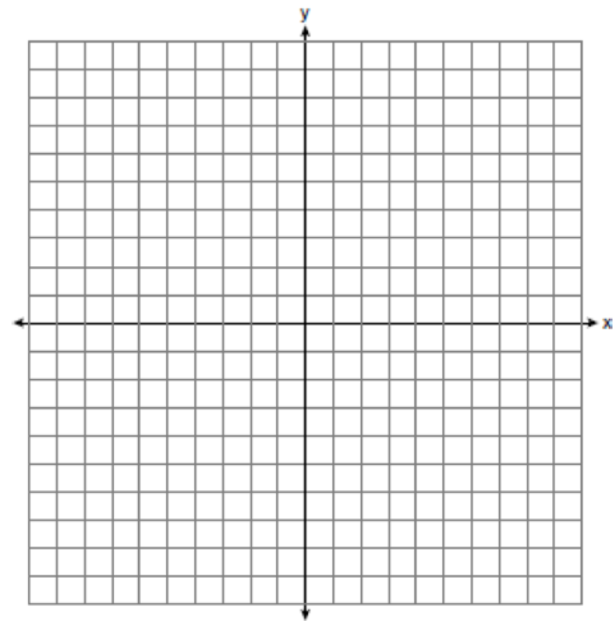
226 On the set of axes below, graph the locus of points 4 units from the x-axis and equidistant from the points whose coordinates are $(-2,0)$ and $(8,0)$. Mark with an **X** all points that satisfy *both* conditions.



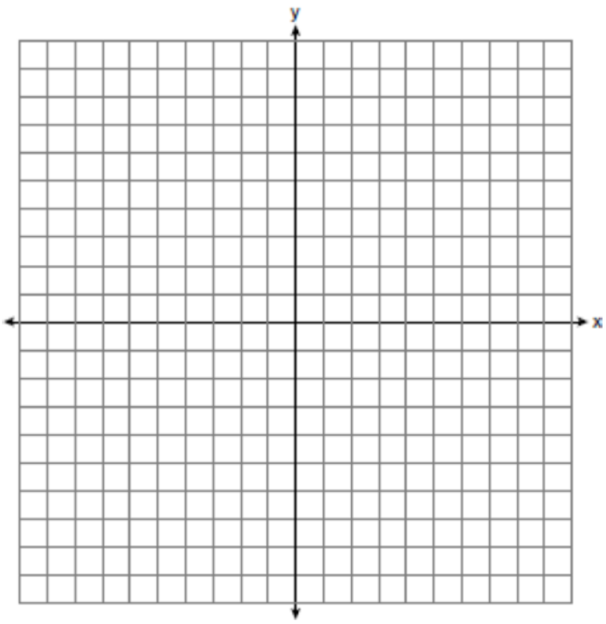
227 In a coordinate plane, the locus of points 5 units from the x-axis is the
1 lines $x = 5$ and $x = -5$
2 lines $y = 5$ and $y = -5$
3 line $x = 5$, only
4 line $y = 5$, only

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

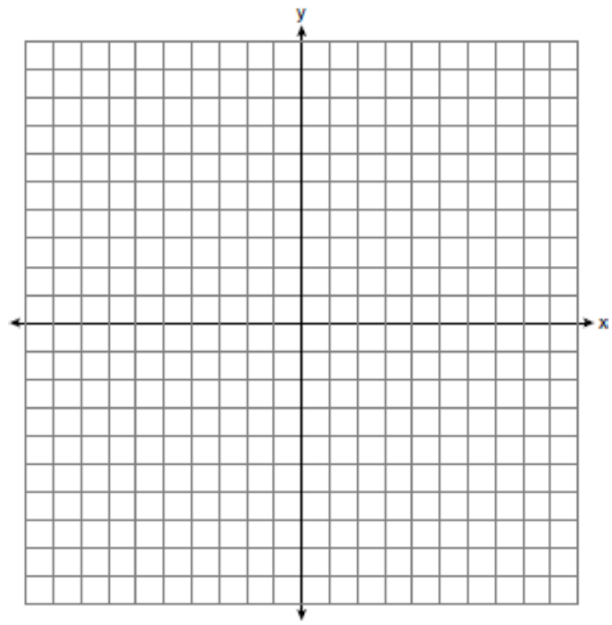
229 On the set of axes below, sketch the locus of points 2 units from the x-axis and sketch the locus of points 6 units from the point $(0,4)$. Label with an **X** all points that satisfy both conditions.



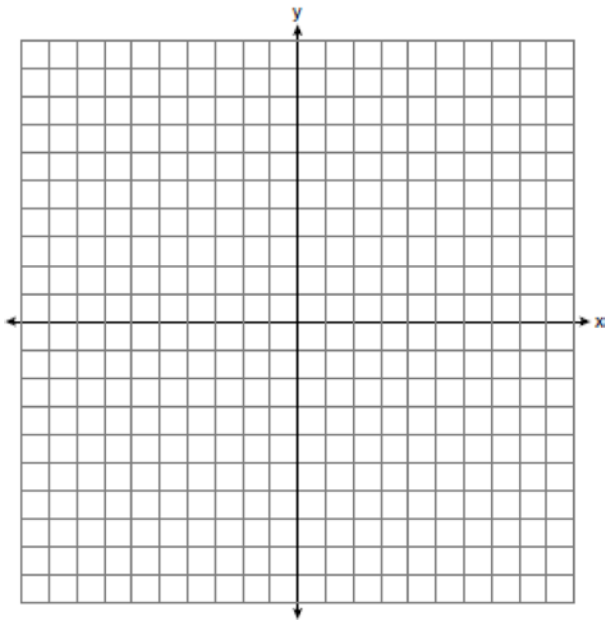
230 On the set of axes below, graph the locus of points 5 units from the point $(3,-2)$. On the same set of axes, graph the locus of points equidistant from the points $(0,-6)$ and $(2,-4)$. State the coordinates of all points that satisfy *both* conditions.



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



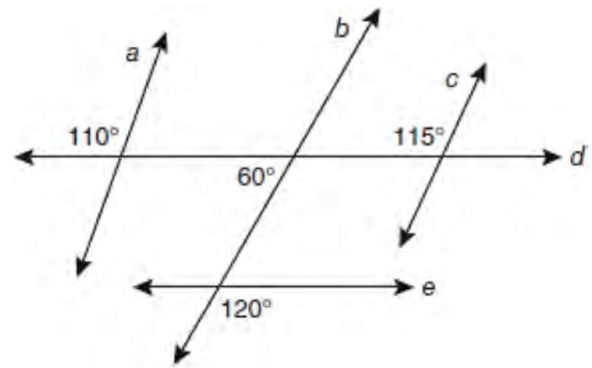
232 On the set of axes below, graph the locus of points 5 units from the point $(2,-3)$ and the locus of points 2 units from the line whose equation is $y = -1$. State the coordinates of all points that satisfy *both* conditions.



ANGLES

G.G.35: PARALLEL LINES & TRANSVERSALS

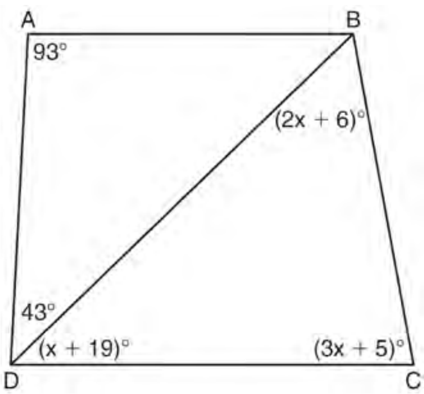
233 Based on the diagram below, which statement is true?



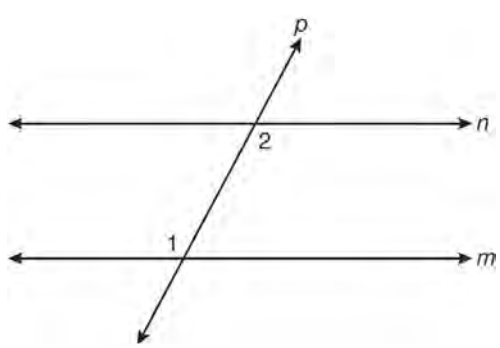
1 $a \parallel b$
2 $a \parallel c$
3 $b \parallel c$
4 $d \parallel e$

234 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.

235 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.

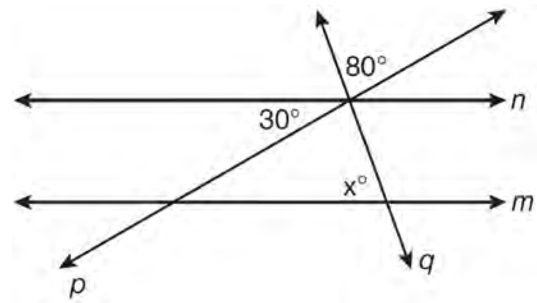


236 In the diagram below, line p intersects line m and line n.



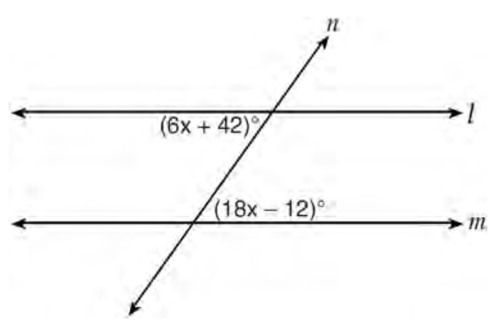
If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines m and n are parallel when x equals
1 12.5
2 15
3 87.5
4 105

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



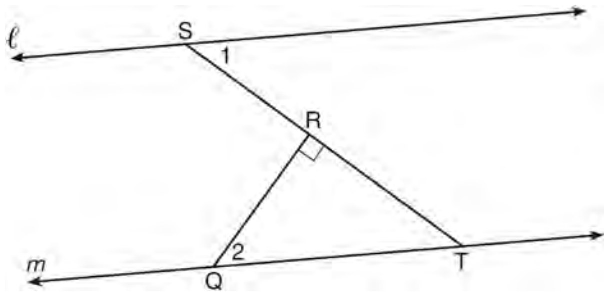
What value of x would make lines n and m parallel?
1 110
2 80
3 70
4 50

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



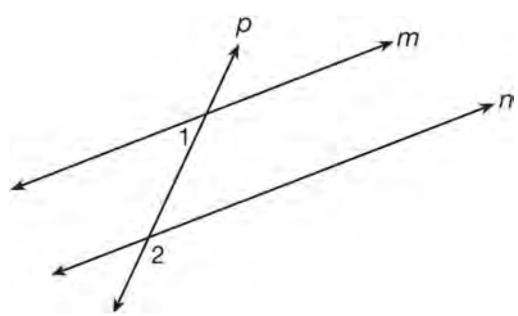
Which value of x would prove $l \parallel m$?
1 2.5
2 4.5
3 6.25
4 8.75

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



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

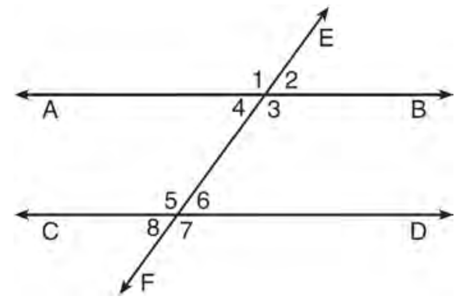
240 As shown in the diagram below, lines m and n are cut by transversal p.



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

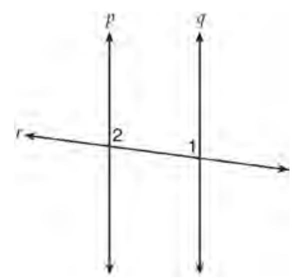
241 Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.



Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?

1 $\angle 2 \cong \angle 4$
2 $\angle 7 \cong \angle 8$
3 $\angle 3$ and $\angle 6$ are supplementary
4 $\angle 1$ and $\angle 5$ are supplementary

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

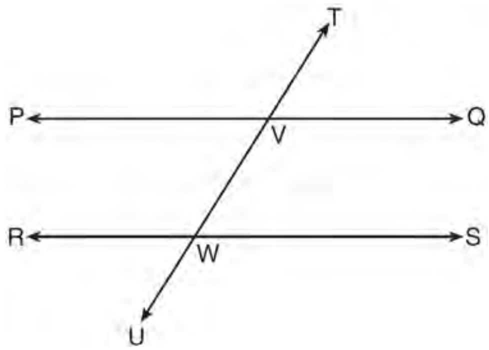


If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?

1 17
2 24
3 83
4 97

Geometry Regents Exam Questions by Performance Indicator: Topic

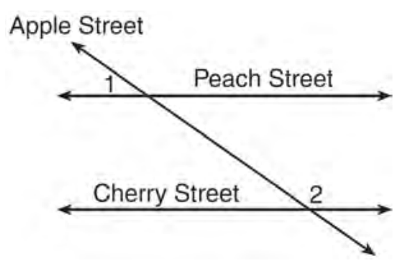
243 In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.



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

1 6
2 16
3 24
4 28

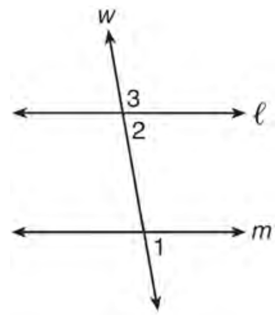
244 Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?

1 9
2 17
3 54
4 70

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



(Not drawn to scale)

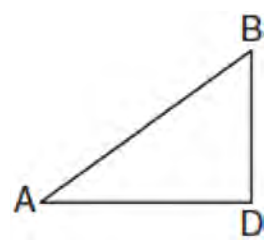
If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?

1 19
2 23
3 74
4 86

TRIANGLES

G.G.48: PYTHAGOREAN THEOREM

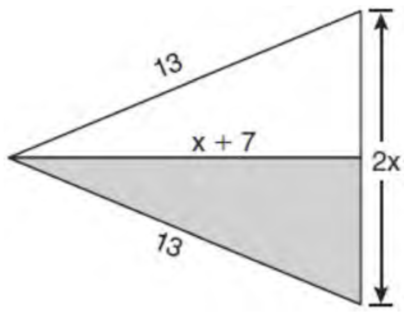
246 In the diagram below of $\triangle ADB$, $m\angle BDA = 90$, $AD = 5\sqrt{2}$, and $AB = 2\sqrt{15}$.



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

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

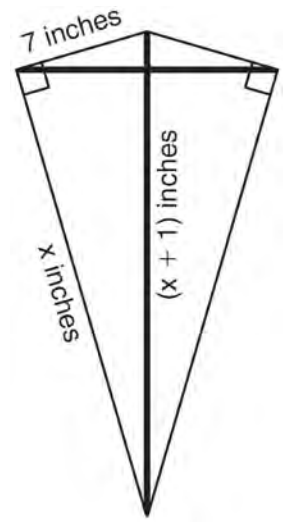
247 The diagram below shows a pennant in the shape of an isosceles triangle. The equal sides each measure 13, the altitude is $x+7$, and the base is $2x$.



What is the length of the base?
1 5
2 10
3 12
4 24

248 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 $\{15,36,39\}$

249 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

250 Which set of numbers could *not* represent the lengths of the sides of a right triangle?
1 $\{1,3,\sqrt{10}\}$
2 $\{2,3,4\}$
3 $\{3,4,5\}$
4 $\{8,15,17\}$

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

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

252 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°

253 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°

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

255 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

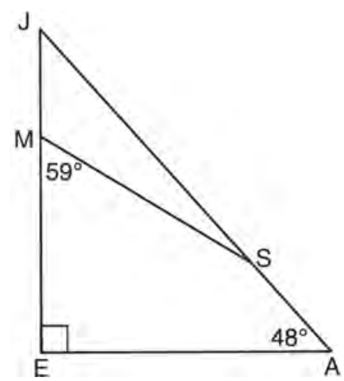
256 In right $\triangle DEF$, $m\angle D = 90$ and $m\angle F$ is 12 degrees less than twice $m\angle E$. Find $m\angle E$.

257 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 $m\angle D = m\angle F$

258 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

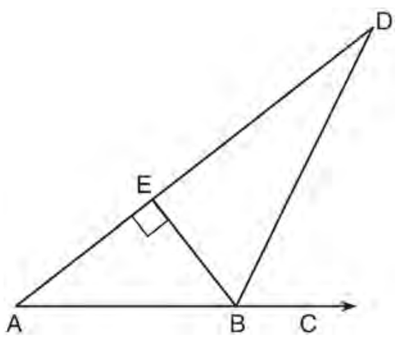
259 The angles of triangle ABC are in the ratio of $8:3:4$. What is the measure of the *smallest* angle?
1 12º
2 24º
3 36º
4 72º

260 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

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



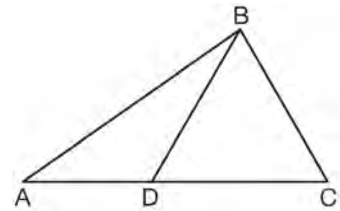
If $m\angle ABE = 52$, what is $m\angle D$?
1 26
2 38
3 52
4 64

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

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

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

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

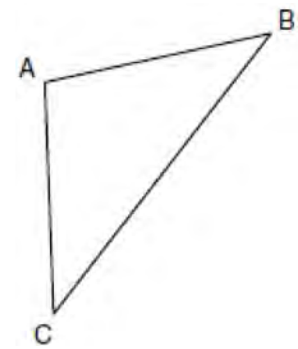


If $m\angle A = 35$, $m\angle ABD = 25$, and $m\angle C = 60$, which type of triangle is $\triangle BCD$?
1 equilateral
2 scalene
3 obtuse
4 right

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

G.G.31: ISOSCELES TRIANGLE THEOREM

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



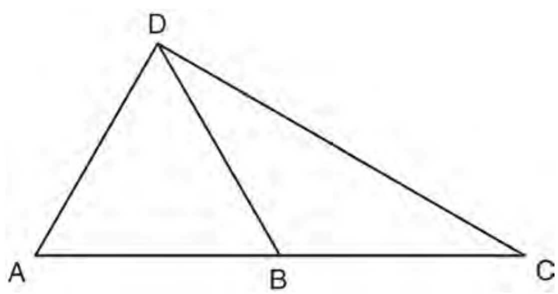
What is the measure of $\angle A$?
1 40°
2 50°
3 70°
4 100°

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

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

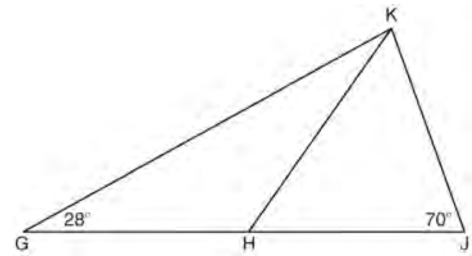
270 In isosceles triangle ABC, $AB = BC$. Which statement will always be true?
1 $m\angle B = m\angle A$
2 $m\angle A > m\angle B$
3 $m\angle A = m\angle C$
4 $m\angle C < m\angle B$

271 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 $m\angle C$.

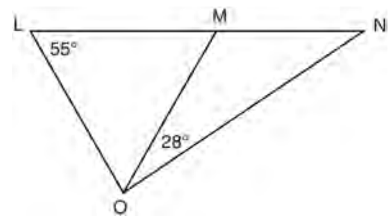


272 If the vertex angles of two isosceles triangles are congruent, then the triangles must be
1 acute
2 congruent
3 right
4 similar

273 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.

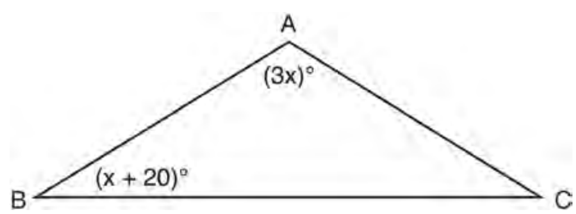


274 In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.



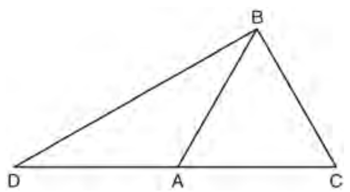
If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?
1 27
2 28
3 42
4 70

275 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

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

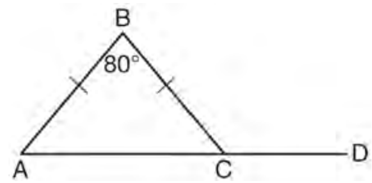


In $\triangle DAB$, $m\angle D = x$, $m\angle DAB = 5x - 30$, and $m\angle DBA = 3x - 60$. In $\triangle ABC$, $AB = 6y - 8$ and $BC = 4y - 2$. [Only algebraic solutions can receive full credit.] Find $m\angle D$. Find $m\angle BAC$. Find the length of $\overline{BC}$. Find the length of $\overline{DC}$.

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

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

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



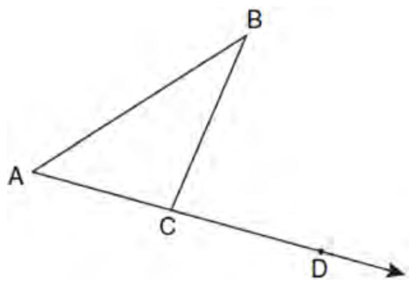
1 50
2 80
3 100
4 130

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

G.G.32: EXTERIOR ANGLE THEOREM

281 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 $m\angle RQT > m\angle PQR$

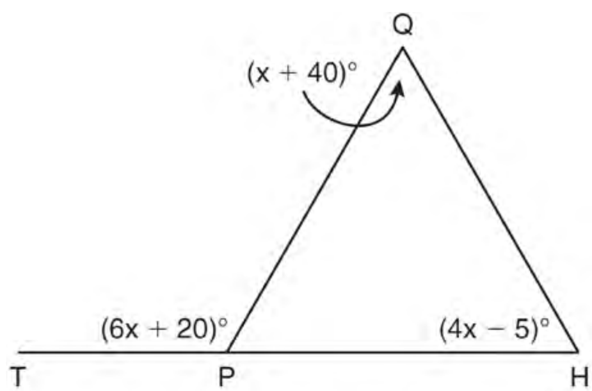
282 In the diagram below, $\triangle ABC$ is shown with $\overline{AC}$ extended through point D.



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

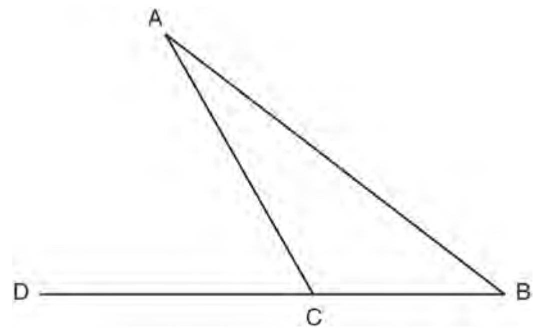
1 12
2 $14\frac{10}{11}$
3 16
4 $18\frac{1}{9}$

283 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 $m\angle QPT$.



(Not drawn to scale)

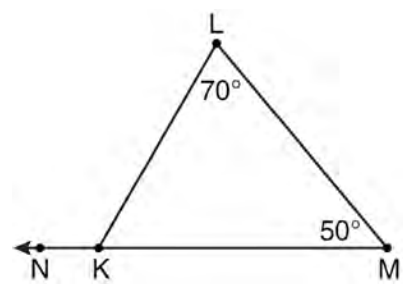
284 In the diagram below of $\triangle ABC$, side $\overline{BC}$ is extended to point D, $m\angle A = x$, $m\angle B = 2x + 15$, and $m\angle ACD = 5x + 5$.



What is $m\angle B$?

1 5
2 20
3 25
4 55

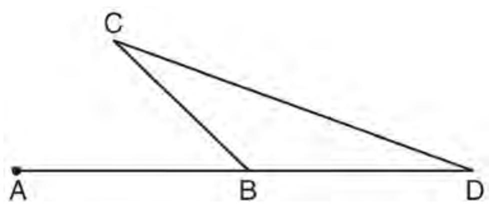
285 In the diagram of $\triangle KLM$ below, $m\angle L = 70$, $m\angle M = 50$, and $\overline{MK}$ is extended through N.



What is the measure of $\angle LKN$?

1 60º
2 120º
3 180º
4 300º

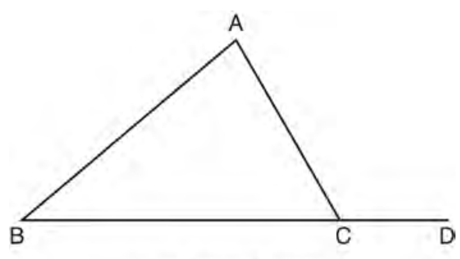
286 In the diagram below of $\triangle BCD$, side $\overline{DB}$ is extended to point A.



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 $m\angle ABC > m\angle C + m\angle D$

287 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

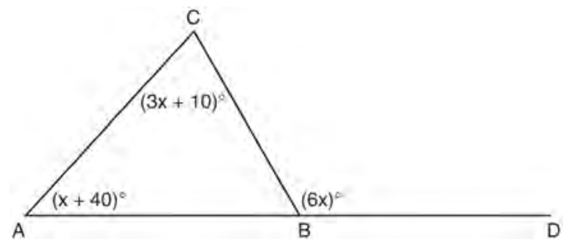
288 In the diagram below of $\triangle ABC$, $\overline{BC}$ is extended to D.



(Not drawn to scale)

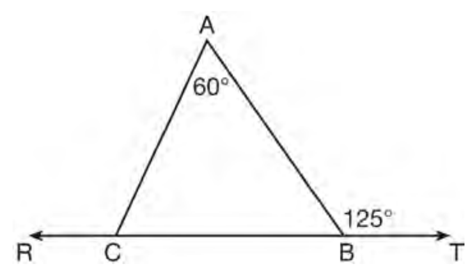
If $m\angle A = x^2 - 6x$, $m\angle B = 2x - 3$, and $m\angle ACD = 9x + 27$, what is the value of x?
1 10
2 2
3 3
4 15

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



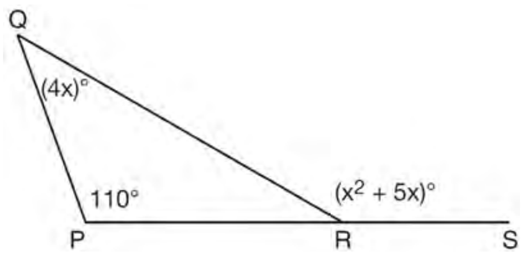
If $m\angle CAB = x + 40$, $m\angle ACB = 3x + 10$, $m\angle CBD = 6x$, what is $m\angle CAB$?
1 13
2 25
3 53
4 65

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



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

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



What is $m\angle Q$?

1 44
2 40
3 11
4 10

292 In $\triangle ABC$, an exterior angle at C measures 50°. If $m\angle A > 30$. which inequality must be true?

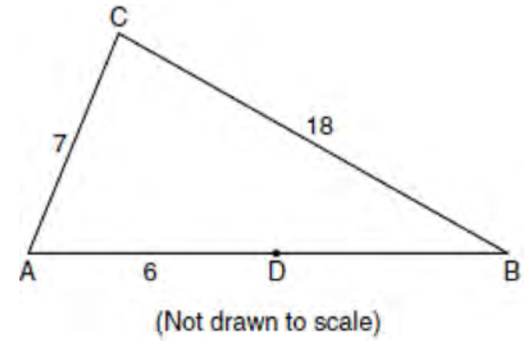
1 $m\angle B < 20$
2 $m\angle B > 20$
3 $m\angle BCA < 130$
4 $m\angle BCA > 130$

293 In all isosceles triangles, the exterior angle of a base angle must always be

1 a right angle
2 an acute angle
3 an obtuse angle
4 equal to the vertex angle

G.G.33: TRIANGLE INEQUALITY THEOREM

294 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

295 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 $\{26, 8, 15\}$

296 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 $3 < AC < 7$

297 Which numbers could represent the lengths of the sides of a triangle?

1 $5, 9, 14$
2 $7, 7, 15$
3 $1, 2, 4$
4 $3, 6, 8$

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

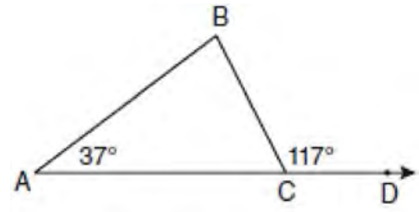
299 The lengths of two sides of a triangle are 7 and 11. Which inequality represents all possible values for x, the length of the third side of the triangle?
1 $4 \le x \le 18$
2 $4 < x \le 18$
3 $4 \le x < 18$
4 $4 < x < 18$

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

G.G.34: ANGLE SIDE RELATIONSHIP

301 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 $BC < AC < AB$

302 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)

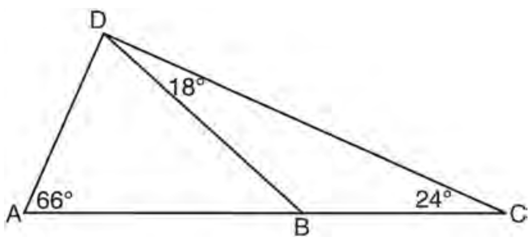
303 In $\triangle PQR$, $PQ = 8$, $QR = 12$, and $RP = 13$. Which statement about the angles of $\triangle PQR$ must be true?
1 $m\angle Q > m\angle P > m\angle R$
2 $m\angle Q > m\angle R > m\angle P$
3 $m\angle R > m\angle P > m\angle Q$
4 $m\angle P > m\angle R > m\angle Q$

304 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 $\angle C, \angle A, \angle B$

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

306 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 $RS < TS < RT$

307 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 $\overline{BD}$

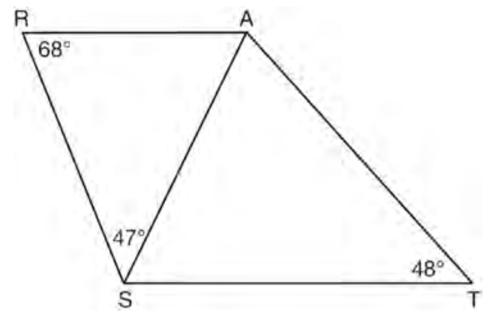
308 In $\triangle ABC$, $m\angle A = x^2 + 12$, $m\angle B = 11x + 5$, and $m\angle C = 13x - 17$. Determine the longest side of $\triangle ABC$.

309 In $\triangle ABC$, $m\angle A = 60$, $m\angle B = 80$, and $m\angle C = 40$. Which inequality is true?
1 $AB > BC$
2 $AC > BC$
3 $AC < BA$
4 $BC < BA$

310 In $\triangle ABC$, $\angle A \cong \angle B$ and $\angle C$ is an obtuse angle. Which statement is true?
1 $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the longest side.
2 $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the longest side.
3 $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the shortest side.
4 $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the shortest side.

311 For which measures of the sides of $\triangle ABC$ is angle B the largest angle of the triangle?
1 $AB = 2$, $BC = 6$, $AC = 7$
2 $AB = 6$, $BC = 12$, $AC = 8$
3 $AB = 16$, $BC = 9$, $AC = 10$
4 $AB = 18$, $BC = 14$, $AC = 5$

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



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

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

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

315 In $\triangle ABC$, $m\angle A = 65$ and $m\angle B$ is greater than $m\angle A$. The lengths of the sides of $\triangle ABC$ in order from smallest to largest are

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

316 In $\triangle ABC$, $m\angle B < m\angle A < m\angle C$. Which statement is *false*?

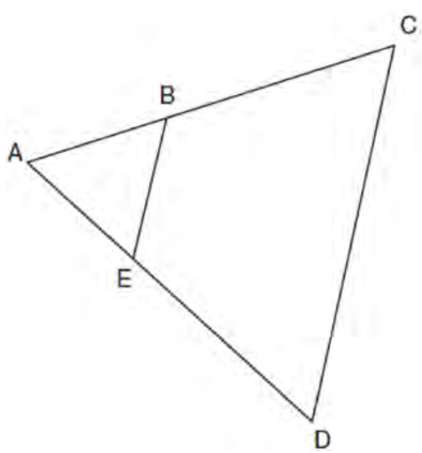
1 $AC > BC$
2 $BC > AC$
3 $AC < AB$
4 $BC < AB$

G.G.46: SIDE SPLITTER THEOREM

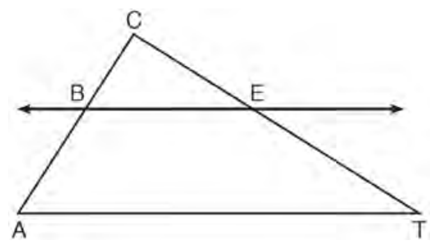
317 In $\triangle ABC$, point D is on $\overline{AB}$, and point E is on $\overline{BC}$ such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of $\overline{AC}$?

1 8
2 9
3 10.5
4 13.5

318 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 $\overline{EB}$.



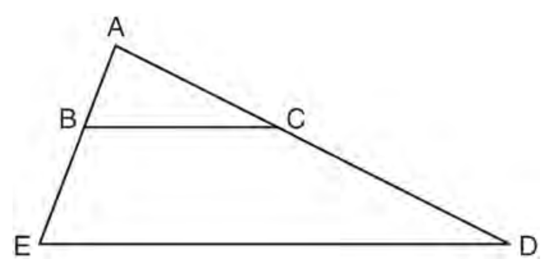
319 In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overline{AT}$.



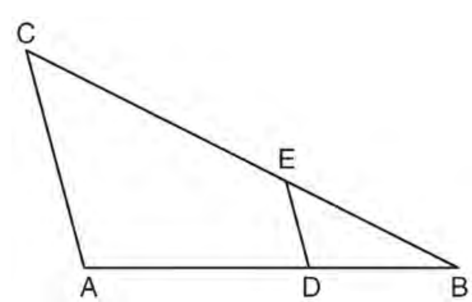
If $CB = 3$, $CA = 10$, and $CE = 6$, what is the length of $\overline{ET}$?

1 5
2 14
3 20
4 26

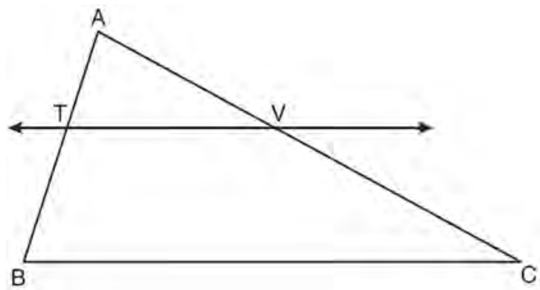
320 In the diagram below of $\triangle ADE$, B is a point on $\overline{AE}$ and C is a point on $\overline{AD}$ such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length of $\overline{AC}$.



321 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 $\overline{EB}$.

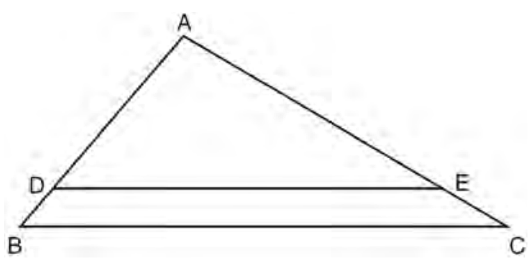


322 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.



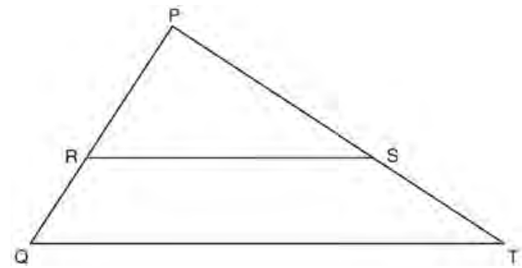
What is the length of $\overline{VC}$?
1 $3\frac{1}{2}$
2 $7\frac{1}{7}$
3 14
4 24

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



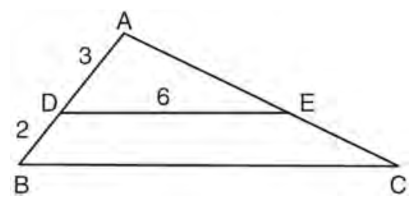
If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?
1 6
2 2
3 3
4 15

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



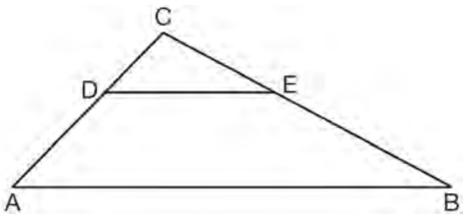
If $PR = 12$, $RQ = 8$, and $PS = 21$, what is the length of $\overline{PT}$?
1 14
2 17
3 35
4 38

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



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

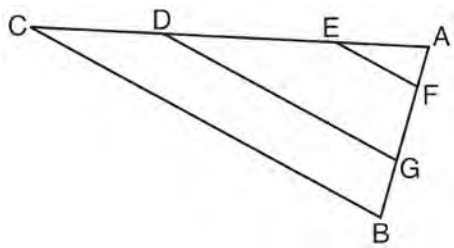
326 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{AB}$.



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

1 10
2 8
3 6
4 4

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

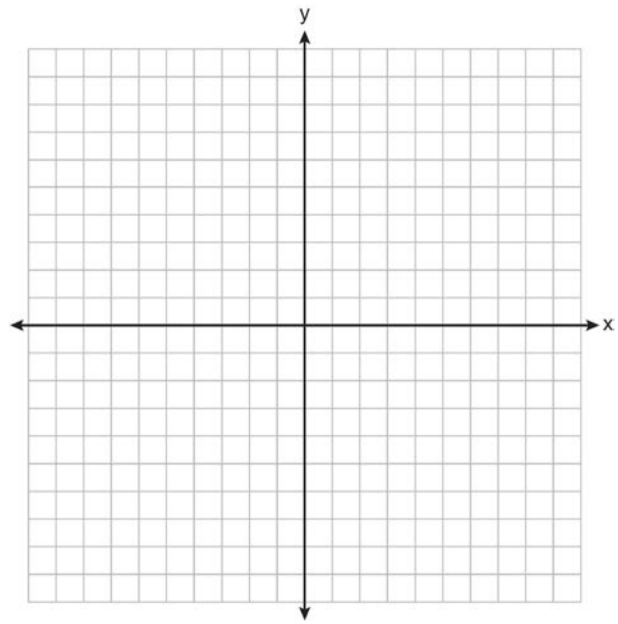


Which statement is *false*?

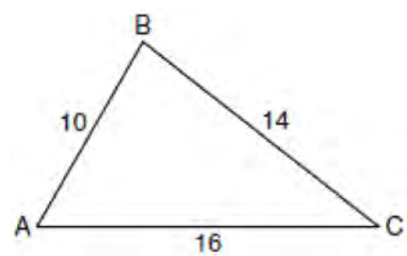
1 $\dfrac{AC}{AD} = \dfrac{AB}{AG}$
2 $\dfrac{AE}{AF} = \dfrac{AC}{AB}$
3 $\dfrac{AE}{AD} = \dfrac{EC}{AC}$
4 $\dfrac{BG}{BA} = \dfrac{CD}{CA}$

G.G.42: MIDSEGMENTS

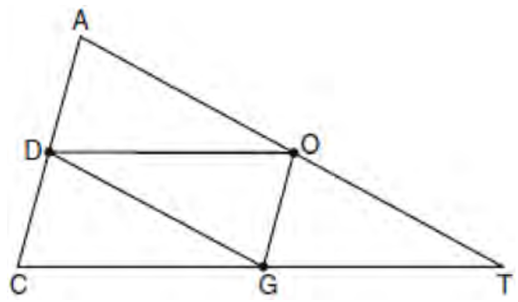
328 On the set of axes below, graph and label $\triangle DEF$ with vertices at $D(-4,-4)$, $E(-2,2)$, and $F(8,-2)$. If G is the midpoint of $\overline{EF}$ and H is the midpoint of $\overline{DF}$, state the coordinates of G and H and label each point on your graph. Explain why $\overline{GH} \parallel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



329 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 $\triangle ABC$.

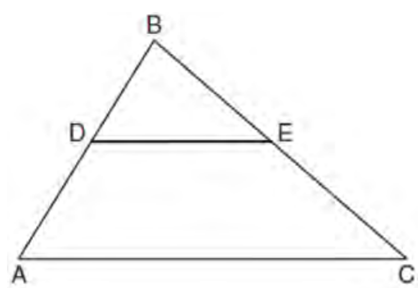


330 In the diagram below of $\triangle ACT$, D is the midpoint of $\overline{AC}$, O is the midpoint of $\overline{AT}$, and G is the midpoint of $\overline{CT}$.

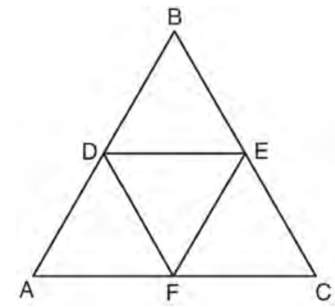


If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?
1 21
2 25
3 32
4 40

331 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 $\triangle ABC$.

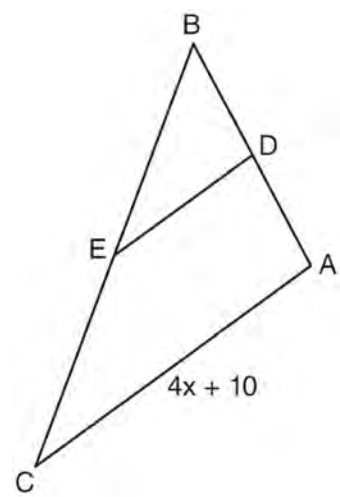


332 In the diagram below, the vertices of $\triangle DEF$ are the midpoints of the sides of equilateral triangle ABC, and the perimeter of $\triangle ABC$ is 36 cm.



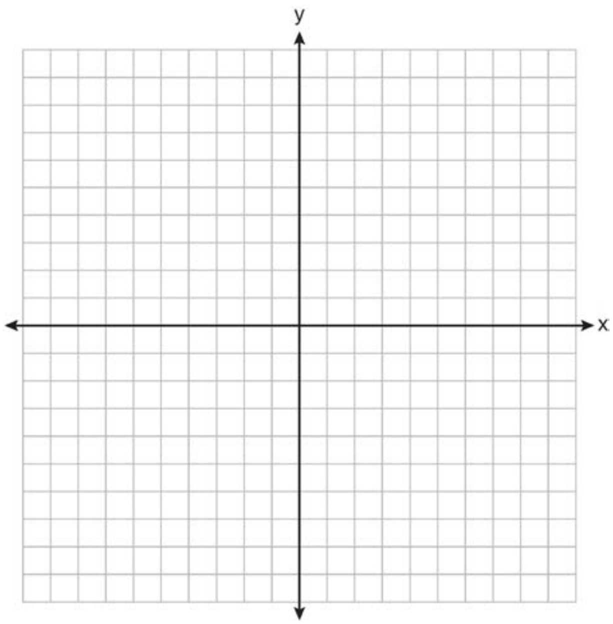
What is the length, in centimeters, of $\overline{EF}$?
1 6
2 12
3 18
4 4

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

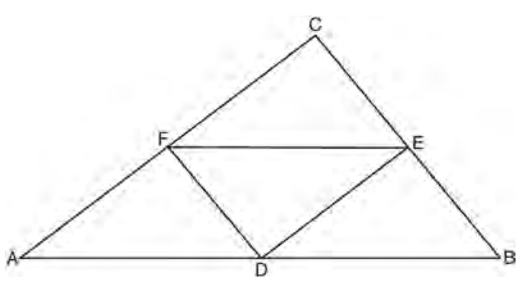


If $AC = 4x + 10$, which expression represents DE?
1 $x + 2.5$
2 $2x + 5$
3 $2x + 10$
4 $8x + 20$

334 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.]

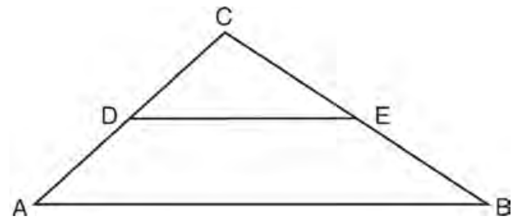


335 In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$.



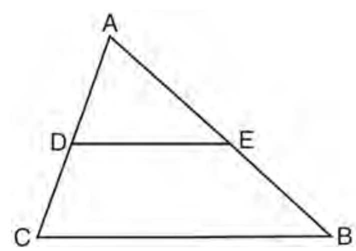
If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?
1 24
2 36
3 40
4 44

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



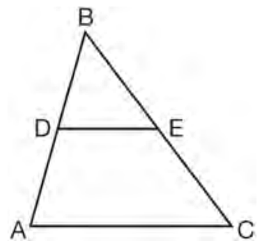
Which statement is *not* true?
1 $CE = \frac{1}{2}CB$
2 $DE = \frac{1}{2}AB$
3 area of $\triangle CDE = \frac{1}{2}$ area of $\triangle CAB$
4 perimeter of $\triangle CDE = \frac{1}{2}$ perimeter of $\triangle CAB$

337 Triangle ABC is shown in the diagram below.



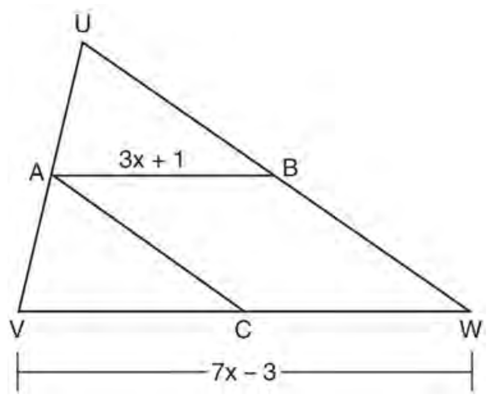
If $\overline{DE}$ joins the midpoints of $\overline{ADC}$ and $\overline{AEB}$, which statement is *not* true?
1 $DE = \frac{1}{2}CB$
2 $\overline{DE} \parallel \overline{CB}$
3 $\frac{AD}{DC} = \frac{DE}{CB}$
4 $\triangle ABC \sim \triangle AED$

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



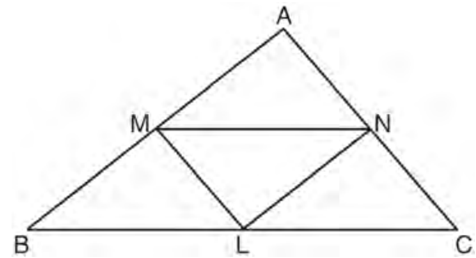
1 6
2 7
3 9
4 12

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



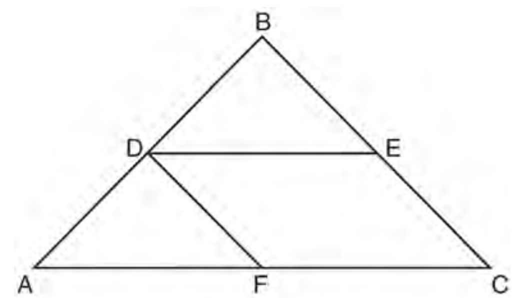
If $VW = 7x - 3$ and $AB = 3x + 1$, what is the length of $\overline{VC}$?
1 5
2 13
3 16
4 32

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



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

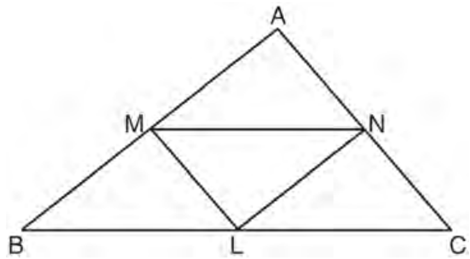
341 In the diagram below of $\triangle ABC$, $\overline{DE}$ and $\overline{DF}$ are midsegments.



(Not drawn to scale)

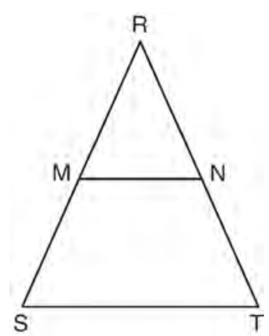
If $DE = 9$, and $BC = 17$, determine and state the perimeter of quadrilateral $FDEC$.

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



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

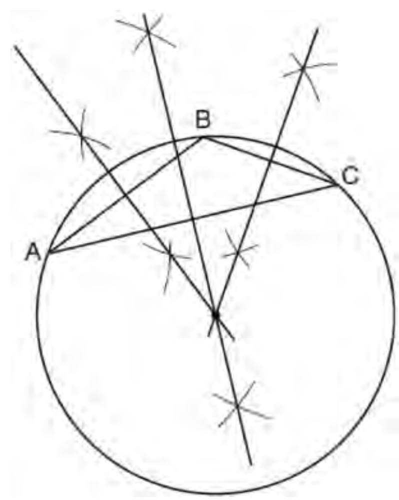
343 In isosceles triangle RST shown below, $\overline{RS} \cong \overline{RT}$, M and N are midpoints of $\overline{RS}$ and $\overline{RT}$, respectively, and $\overline{MN}$ is drawn. If $MN = 3.5$ and the perimeter of $\triangle RST$ is 25, determine and state the length of $\overline{NT}$.



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

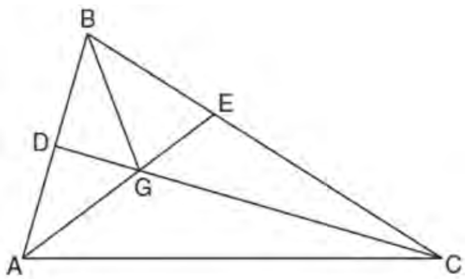
344 In which triangle do the three altitudes intersect outside the triangle?
1 a right triangle
2 an acute triangle
3 an obtuse triangle
4 an equilateral triangle

345 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 $\triangle ABC$

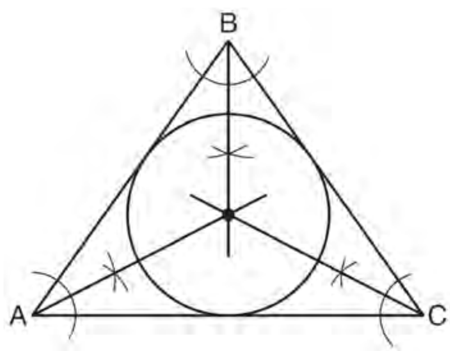
346 In the diagram below of $\triangle ABC$, $\overline{CD}$ is the bisector of $\angle BCA$, $\overline{AE}$ is the bisector of $\angle CAB$, and $\overline{BG}$ is drawn.



Which statement must be true?

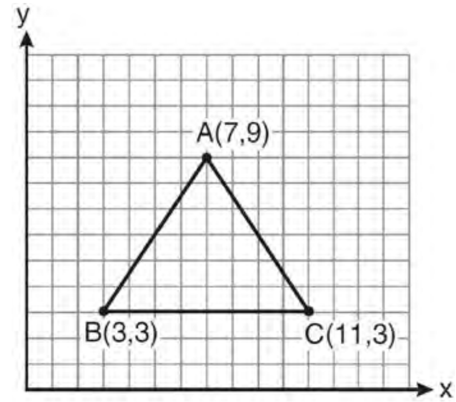
1 $DG = EG$
2 $AG = BG$
3 $\angle AEB \cong \angle AEC$
4 $\angle DBG \cong \angle EBG$

347 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.

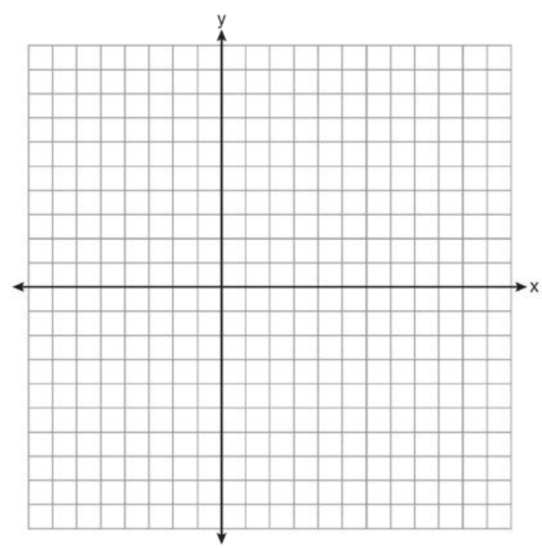
348 The vertices of the triangle in the diagram below are $A(7,9)$, $B(3,3)$, and $C(11,3)$.



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

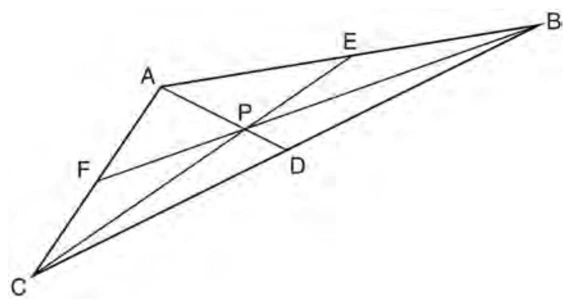
1 $(5,6)$
2 $(7,3)$
3 $(7,5)$
4 $(9,6)$

349 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.]



350 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

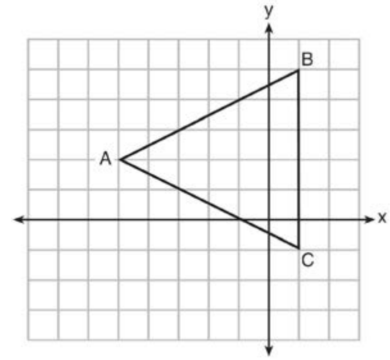
351 In the diagram below of $\triangle ABC$, $\overline{AE} \cong \overline{BE}$, $\overline{AF} \cong \overline{CF}$, and $\overline{CD} \cong \overline{BD}$.



Point P must be the
1 centroid
2 circumcenter
3 Incenter
4 orthocenter

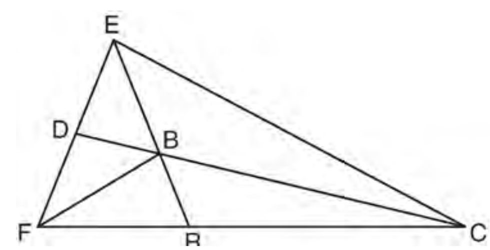
352 For a triangle, which two points of concurrence could be located outside the triangle?
1 incenter and centroid
2 centroid and orthocenter
3 incenter and circumcenter
4 circumcenter and orthocenter

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



What are the coordinates of the point of intersection of the medians of $\triangle ABC$?
1 $(-1,2)$
2 $(-3,2)$
3 $(0,2)$
4 $(1,2)$

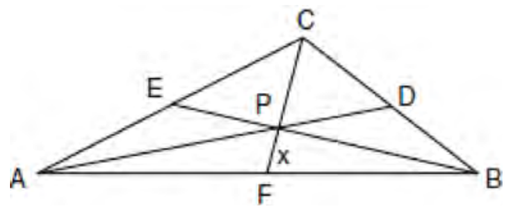
354 In the diagram below, point B is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



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

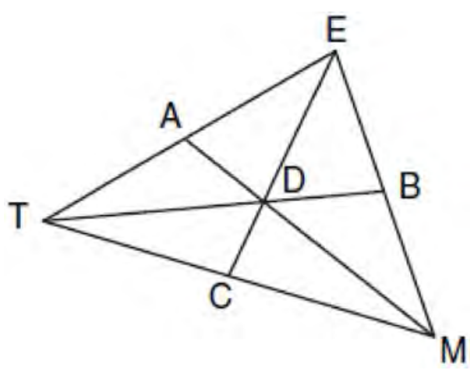
G.G.43: CENTROID

355 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.

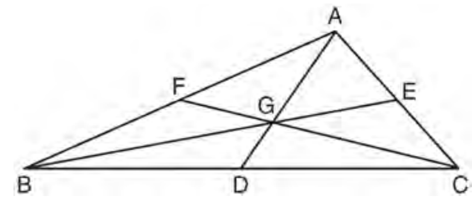


If $PF = x$, which equation can be used to find x?
1 $x + x = 6$
2 $2x + x = 6$
3 $3x + 2x = 6$
4 $x + \frac{2}{3}x = 6$

356 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 $\overline{TD}$.

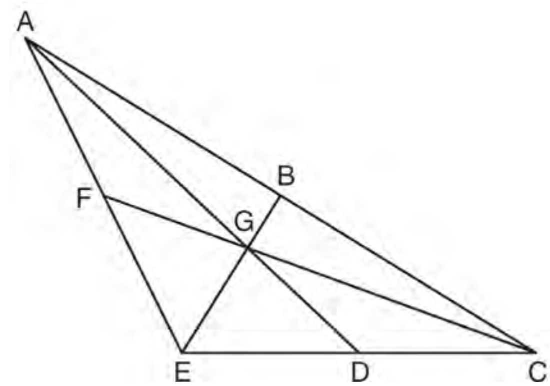


357 In the diagram below of $\triangle ABC$, medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ intersect at G.



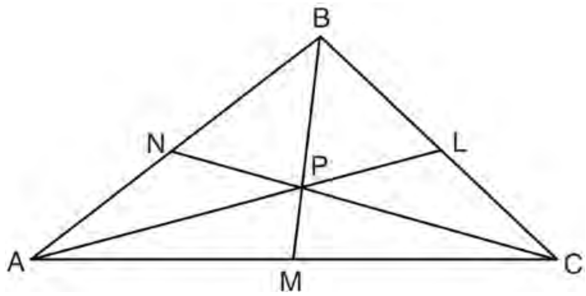
If $CF = 24$, what is the length of $\overline{FG}$?
1 8
2 10
3 12
4 16

358 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.



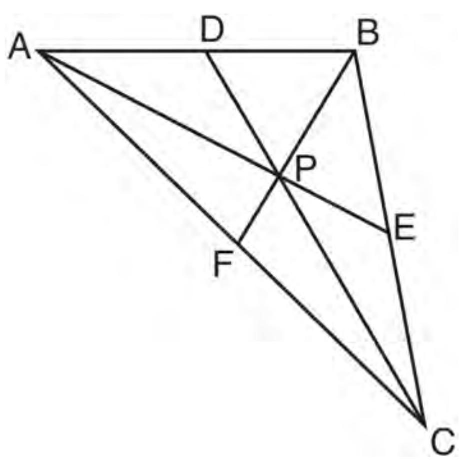
What is the length, in centimeters, of $\overline{GC}$?
1 24
2 12
3 6
4 4

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



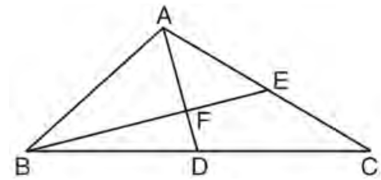
If $PM = 2x + 5$ and $BP = 7x + 4$, what is the length of $\overline{PM}$?
1 9
2 2
3 18
4 27

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



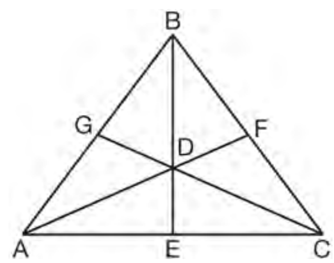
What is the length of $\overline{BP}$?
1 6
2 9
3 3
4 12

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



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

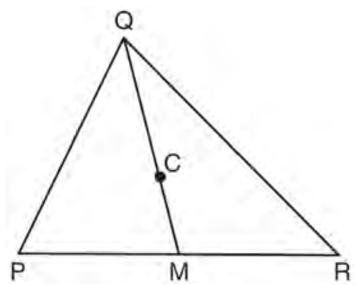
362 As shown below, the medians of $\triangle ABC$ intersect at D.



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

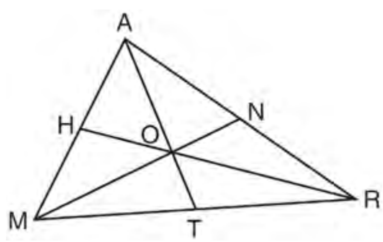
363 The three medians of a triangle intersect at a point. Which measurements could represent the segments of one of the medians?
1 2 and 3
2 3 and 4.5
3 3 and 6
4 3 and 9

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



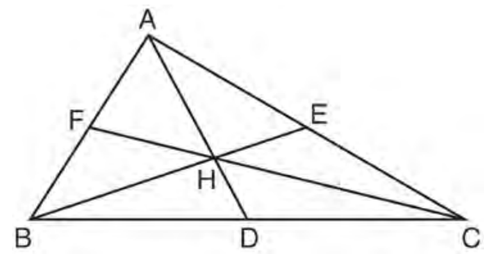
If $QC = 5x$ and $CM = x + 12$, determine and state the length of $\overline{QM}$.

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



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

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

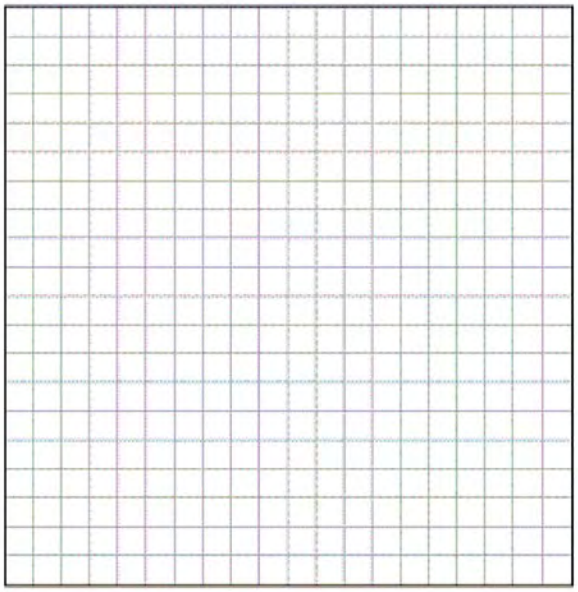


If $\overline{DH}$ measures 2.4 centimeters, what is the length, in centimeters, of $\overline{AD}$?
1 3.6
2 4.8
3 7.2
4 9.6

G.G.69: TRIANGLES IN THE COORDINATE PLANE

367 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 $m\angle ABC = 60$

368 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.]



369 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

370 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

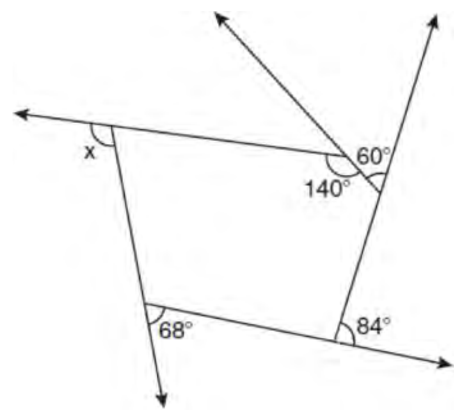
371 If the vertices of $\triangle ABC$ are $A(-2,4)$, $B(-2,8)$, and $C(-5,6)$, then $\triangle ABC$ is classified as
1 right
2 scalene
3 isosceles
4 equilateral

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

POLYGONS

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

373 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

374 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

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

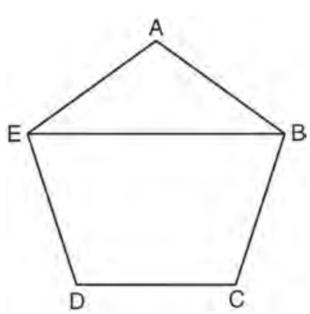
376 The sum of the interior angles of a polygon of n sides is
1 360
2 $\frac{360}{n}$
3 $(n-2)\cdot 180$
4 $\frac{(n-2)\cdot 180}{n}$

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

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

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

379 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

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

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

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

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

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

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

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

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

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

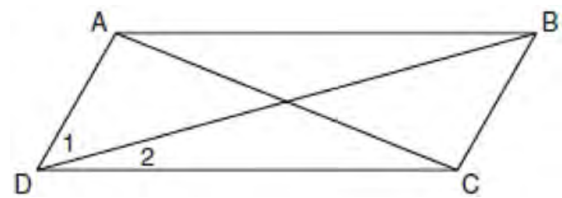
389 A regular polygon with an exterior angle of 40° is a
1 pentagon
2 hexagon
3 nonagon
4 decagon

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

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

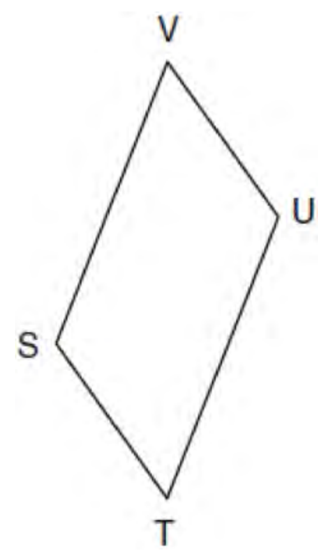
G.G.38: PARALLELOGRAMS

392 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

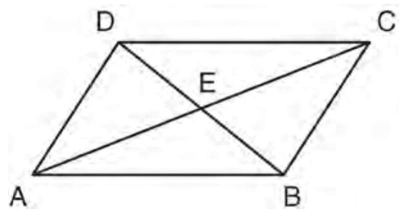
393 In the diagram below of parallelogram *STUV*, $SV = x + 3$, $VU = 2x - 1$, and $TU = 4x - 3$.



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

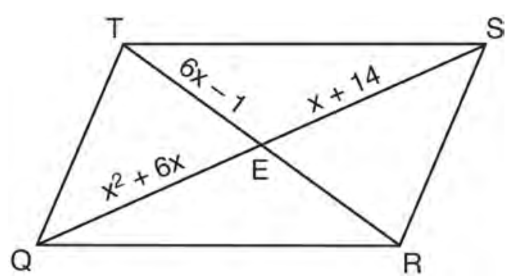
394 Which statement is true about every parallelogram?
1 All four sides are congruent.
2 The interior angles are all congruent.
3 Two pairs of opposite sides are congruent.
4 The diagonals are perpendicular to each other.

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



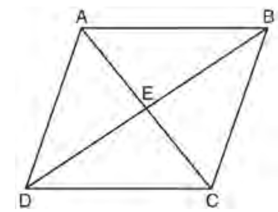
Which expression is *not* always true?
1 $\angle DAE \cong \angle BCE$
2 $\angle DEC \cong \angle BEA$
3 $\overline{AC} \cong \overline{DB}$
4 $\overline{DE} \cong \overline{EB}$

396 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.



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

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



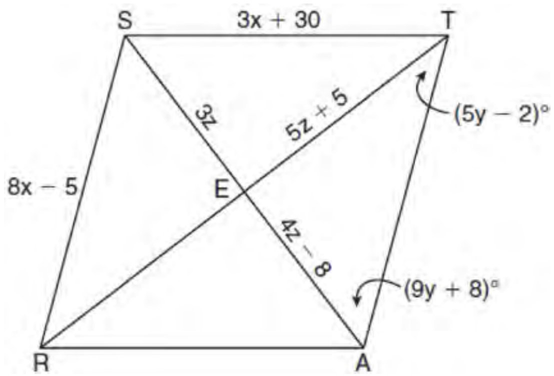
Which statement must be true?
1 $\overline{BE} \cong \overline{CE}$
2 $\angle BAE \cong \angle DCE$
3 $\overline{AB} \cong \overline{BC}$
4 $\angle DAE \cong \angle CBE$

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

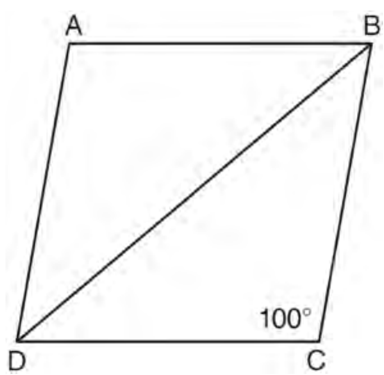
400 In parallelogram $JKLM$, $m\angle L$ exceeds $m\angle M$ by 30 degrees. What is the measure of $m\angle J$?
1 75°
2 105°
3 165°
4 195°

G.G.39: PARALLELOGRAMS

401 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 $m\angle TAS$.



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



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

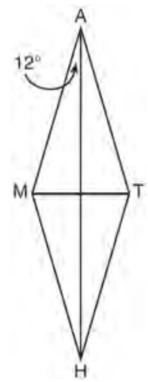
403 In rhombus *ABCD*, the diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*. If $AE = 5$ and $BE = 12$, what is the length of $\overline{AB}$?
1 7
2 10
3 13
4 17

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

405 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

406 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

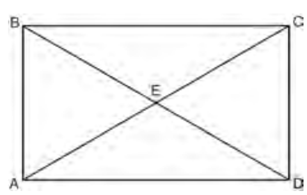
407 In the diagram below, $MATH$ is a rhombus with diagonals $\overline{AH}$ and $\overline{MT}$.



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

408 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.

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



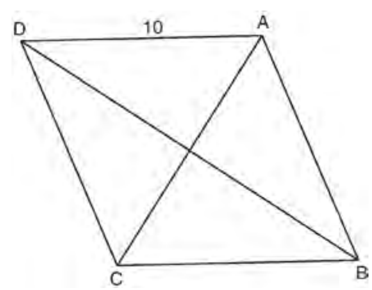
If $AE = x + 2$ and $BD = 4x - 16$, then the length of $\overline{AC}$ is
1 6
2 10
3 12
4 24

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

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

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

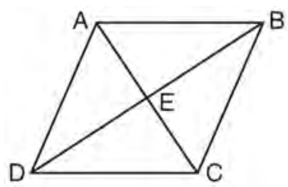
413 In rhombus $ABCD$, with diagonals $\overline{AC}$ and $\overline{DB}$, $AD = 10$.



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

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

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



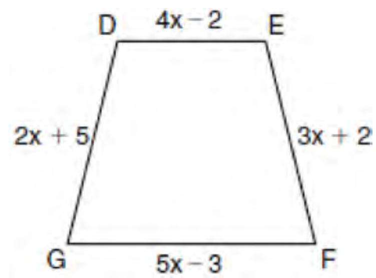
If $AC = 18$ and $BD = 24$, what is the length of one side of rhombus *ABCD?*
1 15
2 18
3 24
4 30

416 In quadrilateral *ABCD*, each diagonal bisects opposite angles. If $m\angle DAB = 70$, then *ABCD* must be a
1 rectangle
2 trapezoid
3 rhombus
4 square

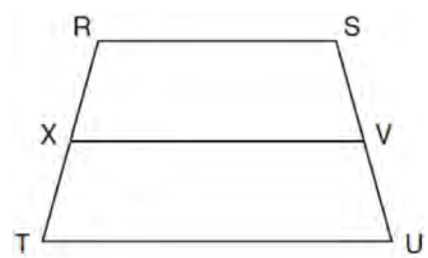
G.G.40: TRAPEZOIDS

417 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 $\frac{1}{2}$

418 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*.



419 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 $\overline{SU}$.

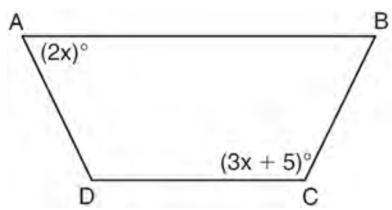


If $RS = 30$ and $XV = 44$, what is the length of $\overline{TU}$?
1 37
2 58
3 74
4 118

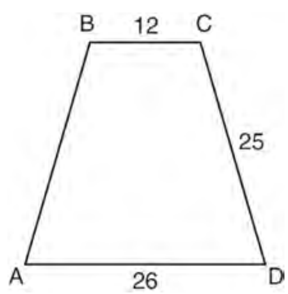
420 If the diagonals of a quadrilateral do *not* bisect each other, then the quadrilateral could be a
1 rectangle
2 rhombus
3 square
4 trapezoid

421 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

422 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 $m\angle BAD$.

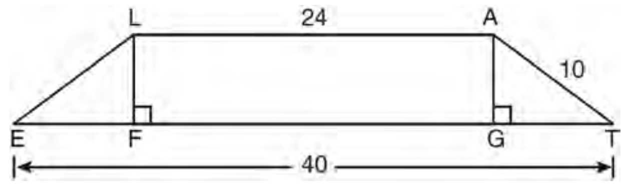


423 In the diagram below of isosceles trapezoid $ABCD$, $AB = CD = 25$, $AD = 26$, and $BC = 12$.



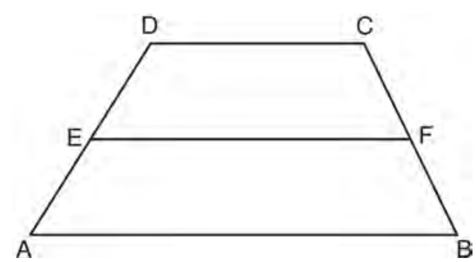
What is the length of an altitude of the trapezoid?
1 7
2 14
3 19
4 24

424 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.



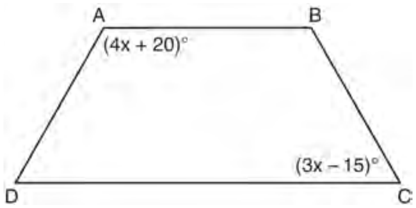
What is the length of $\overline{LF}$?
1 6
2 8
3 3
4 4

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



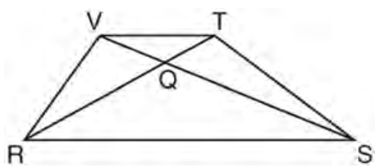
If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of x?
1 5
2 2
3 7
4 8

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



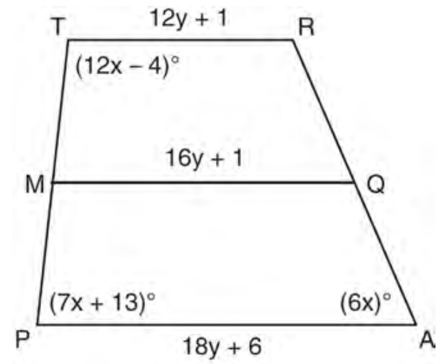
What is $m\angle D$?
1 25
2 35
3 60
4 90

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

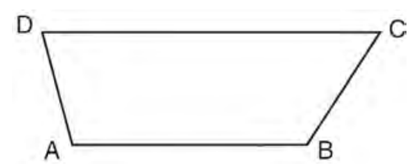


If trapezoid $RSTV$ is *not* isosceles, which triangle is equal in area to $\triangle RSV$?
1 $\triangle RQV$
2 $\triangle RST$
3 $\triangle RVT$
4 $\triangle SVT$

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



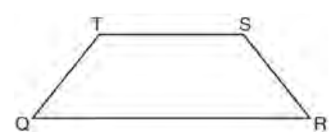
429 In the diagram below, $\overline{AB}$ and $\overline{CD}$ are bases of trapezoid $ABCD$.



(Not drawn to scale)

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

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



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

G.G.41: SPECIAL QUADRILATERALS

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

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

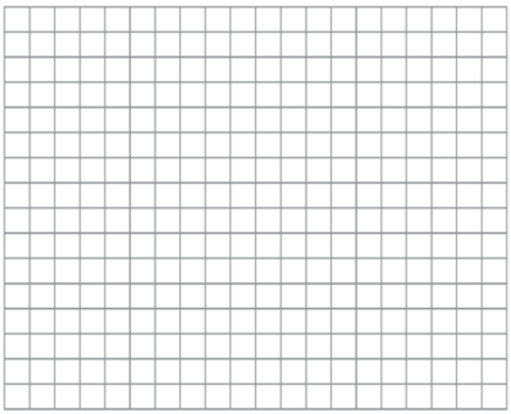
G.G.69: QUADRILATERALS IN THE COORDINATE PLANE

433 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 $\overline{BD}$

434 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.]

435 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.]

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

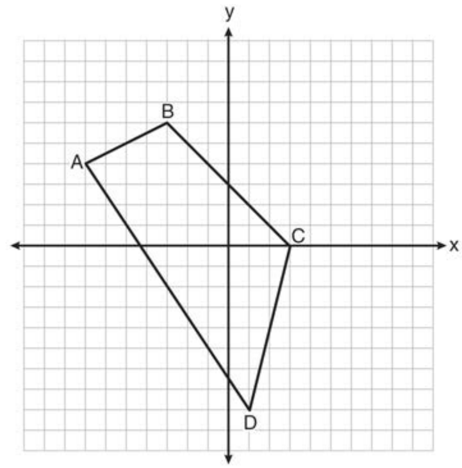


437 Parallelogram *ABCD* has coordinates $A(1,5)$, $B(6,3)$, $C(3,-1)$, and $D(-2,1)$. What are the coordinates of *E*, the intersection of diagonals $\overline{AC}$ and $\overline{BD}$?
1 $(2,2)$
2 $(4.5,1)$
3 $(3.5,2)$
4 $(-1,3)$

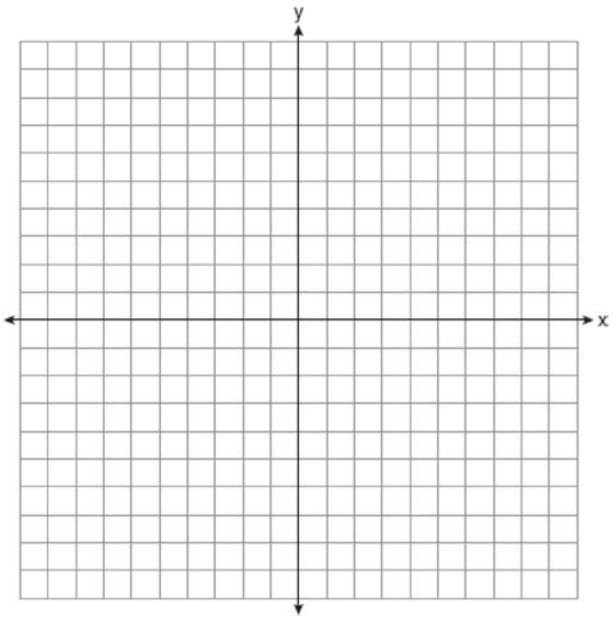
438 Square *ABCD* has vertices $A(-2,-3)$, $B(4,-1)$, $C(2,5)$, and $D(-4,3)$. What is the length of a side of the square?
1 $2\sqrt{5}$
2 $2\sqrt{10}$
3 $4\sqrt{5}$
4 $10\sqrt{2}$

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

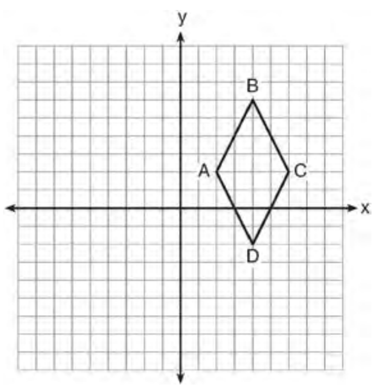
440 Quadrilateral *ABCD* with vertices $A(-7,4)$, $B(-3,6)$, $C(3,0)$, and $D(1,-8)$ is graphed on the set of axes below. Quadrilateral *MNPQ* is formed by joining *M*, *N*, *P*, and *Q*, the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{AD}$, respectively. Prove that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



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



442 Quadrilateral *ABCD* is graphed on the set of axes below.

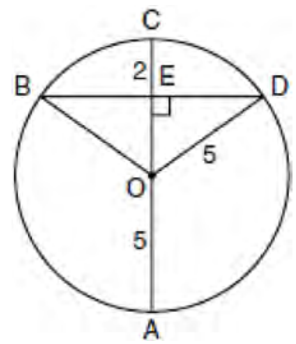


Which quadrilateral best classifies *ABCD*?
1 trapezoid
2 rectangle
3 rhombus
4 square

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

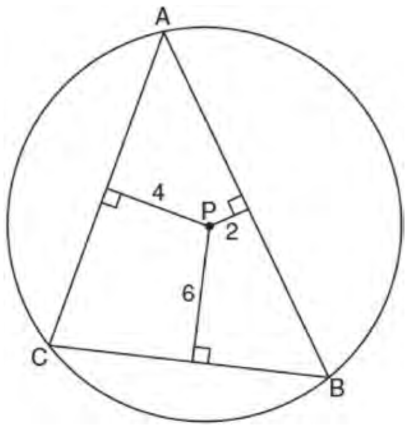
CONICS
G.G.49: CHORDS

444 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

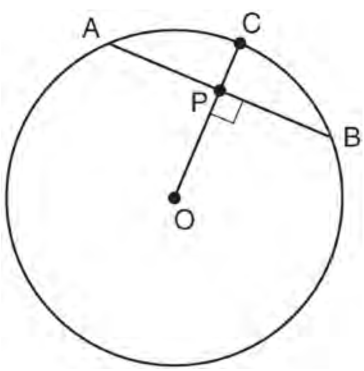
445 In the diagram below, $\triangle ABC$ is inscribed in circle P. The distances from the center of circle P to each side of the triangle are shown.



Which statement about the sides of the triangle is true?

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

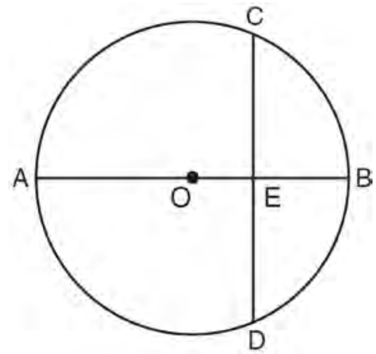
446 In the diagram below of circle O, radius $\overline{OC}$ is 5 cm. Chord $\overline{AB}$ is 8 cm and is perpendicular to $\overline{OC}$ at point P.



What is the length of $\overline{OP}$, in centimeters?

1 8
2 2
3 3
4 4

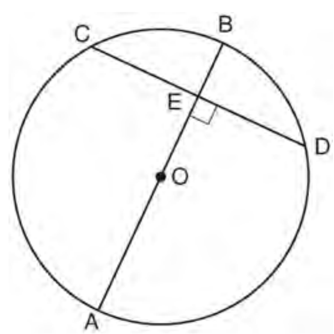
447 In the diagram below of circle O, diameter $\overline{AOB}$ is perpendicular to chord $\overline{CD}$ at point E, $OA = 6$, and $OE = 2$.



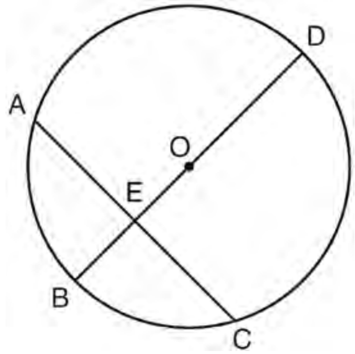
What is the length of $\overline{CE}$?

1 $4\sqrt{3}$
2 $2\sqrt{3}$
3 $8\sqrt{2}$
4 $4\sqrt{2}$

448 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 $\overline{CE}$.

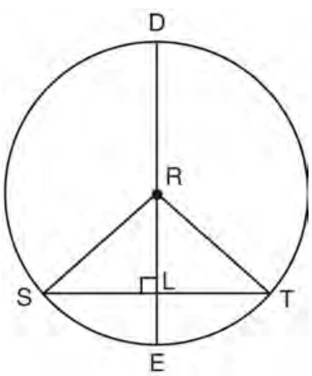


449 In circle O shown below, diameter $\overline{DB}$ is perpendicular to chord $\overline{AC}$ at E.



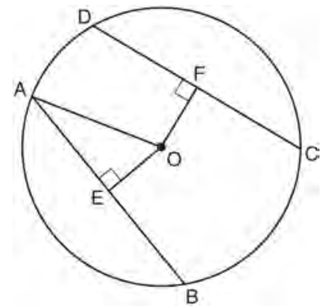
If $DB = 34$, $AC = 30$, and $DE > BE$, what is the length of $\overline{BE}$?
1 8
2 9
3 16
4 25

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



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

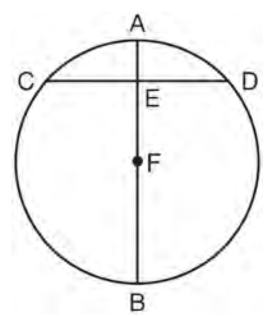
451 In circle O shown below, chords $\overline{AB}$ and $\overline{CD}$ and radius $\overline{OA}$ are drawn, such that $\overline{AB} \cong \overline{CD}$, $\overline{OE} \perp \overline{AB}$, $\overline{OF} \perp \overline{CD}$, $OF = 16$, $CF = y + 10$, and $CD = 4y - 20$.



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

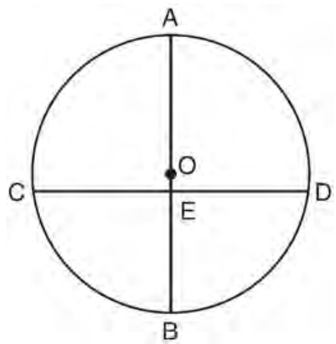
452 In circle O, diameter $\overline{AB}$ intersects chord $\overline{CD}$ at E. If $CE = ED$, then $\angle CEA$ is which type of angle?
1 straight
2 obtuse
3 acute
4 right

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



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

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

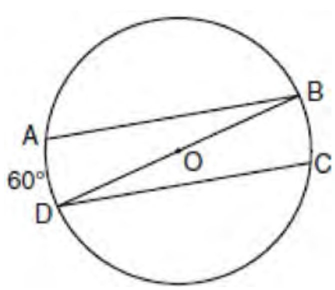


If $\overline{AB} \perp \overline{CD}$, which statement is always true?

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

G.G.52: CHORDS AND SECANTS

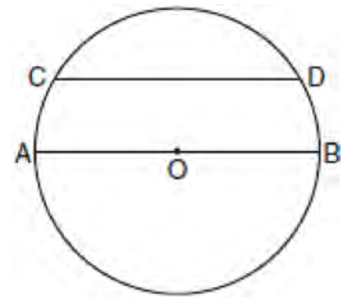
455 In the diagram of circle O below, chords $\overline{AB}$ and $\overline{CD}$ are parallel, and $\overline{BD}$ is a diameter of the circle.



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

1 20
2 30
3 60
4 120

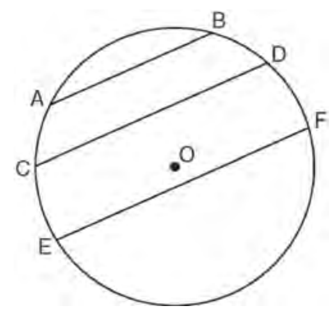
456 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{AC} = 30$.



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

1 150
2 120
3 100
4 60

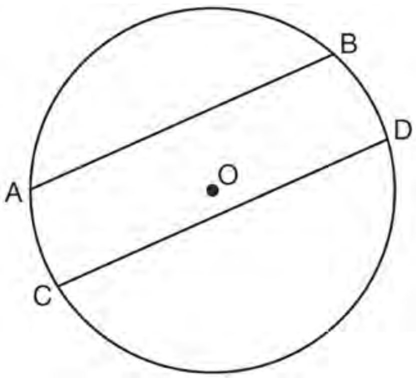
457 In the diagram below of circle O, chord $\overline{AB} \parallel$ chord $\overline{CD}$, and chord $\overline{CD} \parallel$ chord $\overline{EF}$.



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

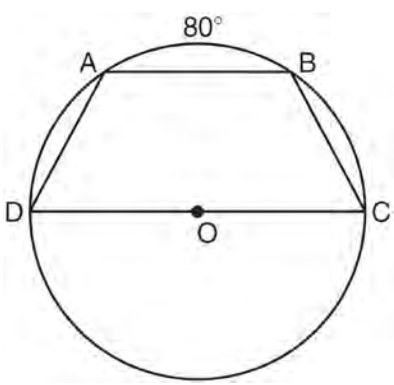
458 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



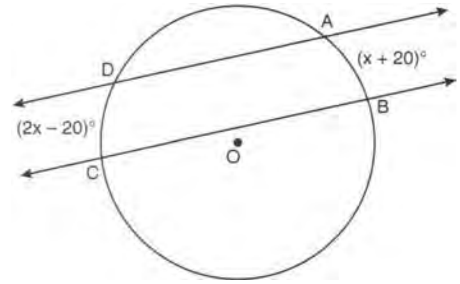
Which statement must be true?

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

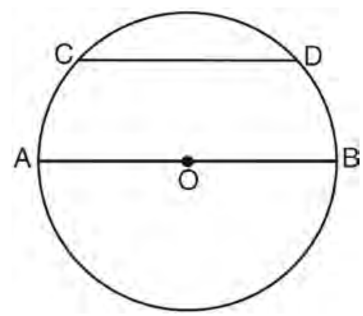
459 In the diagram below, trapezoid $ABCD$, with bases $\overline{AB}$ and $\overline{DC}$, is inscribed in circle O, with diameter $\overline{DC}$. If $m\overparen{AB}=80$, find $m\overparen{BC}$.



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



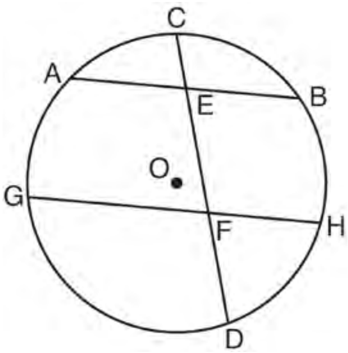
461 In the diagram below of circle O, diameter $\overline{AB}$ is parallel to chord $\overline{CD}$.



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

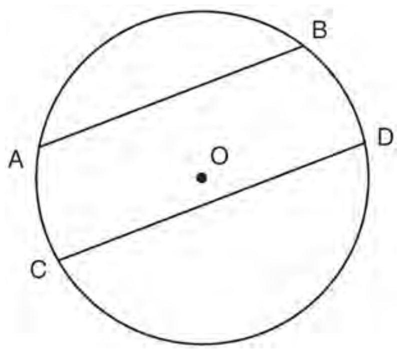
1 110
2 70
3 55
4 35

462 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.



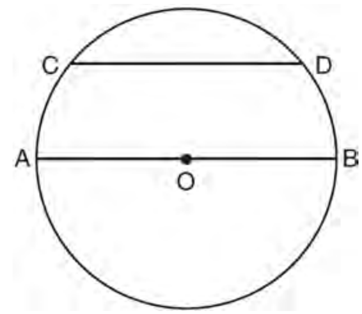
Which statement must always be true?
1 $\overparen{AC} \cong \overparen{CB}$
2 $\overparen{DH} \cong \overparen{BH}$
3 $\overparen{AB} \cong \overparen{GH}$
4 $\overparen{AG} \cong \overparen{BH}$

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



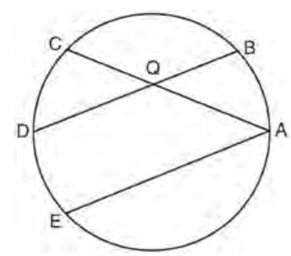
If $m\overparen{AB} = 104$ and $m\overparen{CD} = 168$, what is $m\overparen{BD}$?
1 38
2 44
3 88
4 96

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



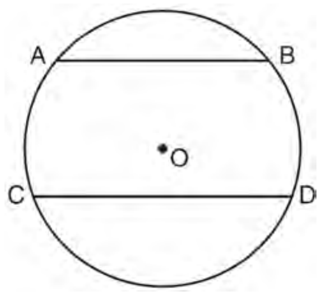
What is $m\overparen{DB}$?
1 35
2 55
3 70
4 110

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



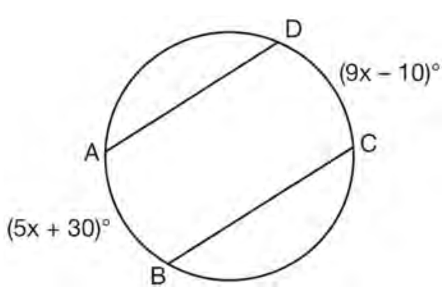
Which statement must always be true?
1 $\overparen{AB} \cong \overparen{CD}$
2 $\overparen{DE} \cong \overparen{CD}$
3 $\overparen{AB} \cong \overparen{DE}$
4 $\overparen{BD} \cong \overparen{AE}$

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



A correct justification for $m\overset{\frown}{AC} = m\overset{\frown}{BD}$ in circle O is
1 parallel chords intercept congruent arcs
2 congruent chords intercept congruent arcs
3 if two chords are parallel, then they are congruent
4 if two chords are equidistant from the center, then the arcs they intercept are congruent

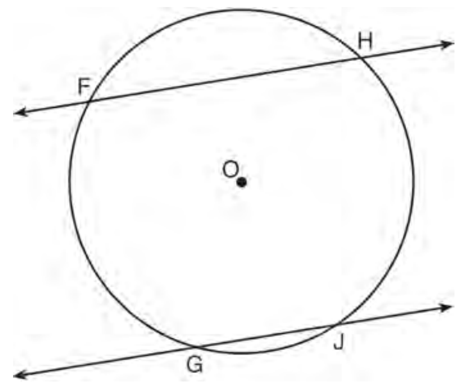
467 In the diagram of the circle below, $\overline{AD} \parallel \overline{BC}$, $\overset{\frown}{AB} = (5x + 30)°$, and $\overset{\frown}{CD} = (9x - 10)°$.



What is $m\overset{\frown}{AB}$?
1 5
2 10
3 55
4 80

468 Points A, B, C, and D are located on circle O, forming trapezoid $ABCD$ with $\overline{AB} \parallel \overline{DC}$. Which statement must be true?
1 $\overline{AB} \cong \overline{DC}$
2 $\overset{\frown}{AD} \cong \overset{\frown}{BC}$
3 $\angle A \cong \angle D$
4 $\overset{\frown}{AB} \cong \overset{\frown}{DC}$

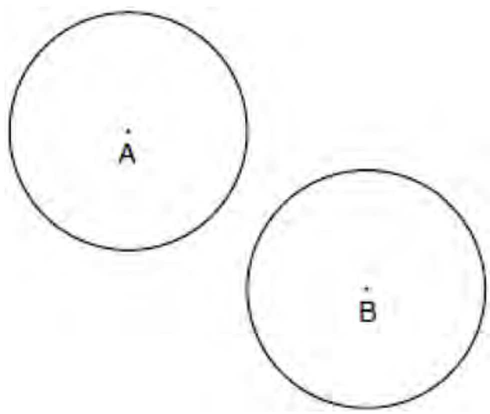
469 Parallel secants $\overleftrightarrow{FH}$ and $\overleftrightarrow{GJ}$ intersect circle O, as shown in the diagram below.



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

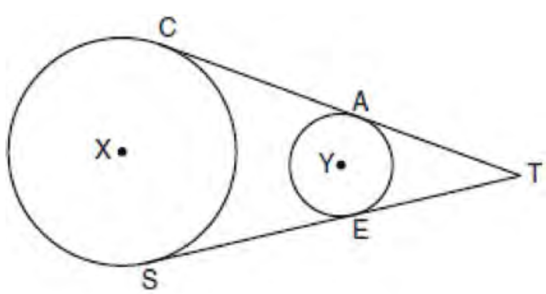
G.G.50: TANGENTS

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



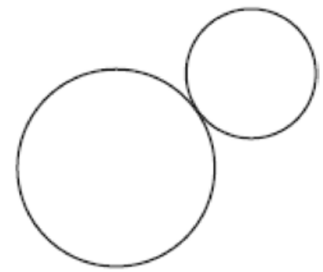
What is the total number of lines of tangency that are common to circle A and circle B?
1 1
2 2
3 3
4 4

471 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)

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

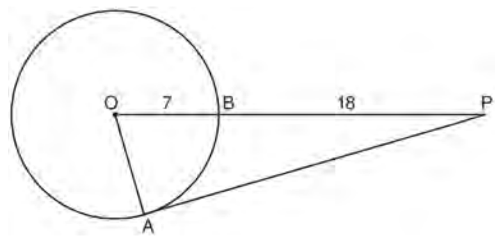


1 1
2 2
3 3
4 4

473 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

474 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

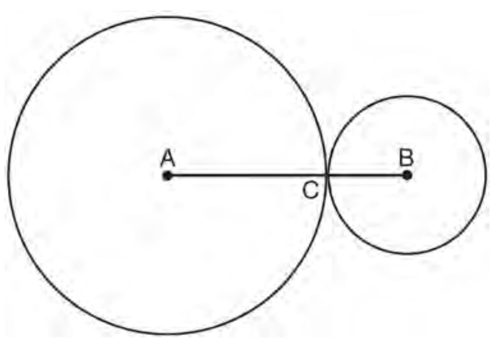
475 In the diagram below of $\triangle PAO$, $\overline{AP}$ is tangent to circle O at point A, $OB = 7$, and $BP = 18$.



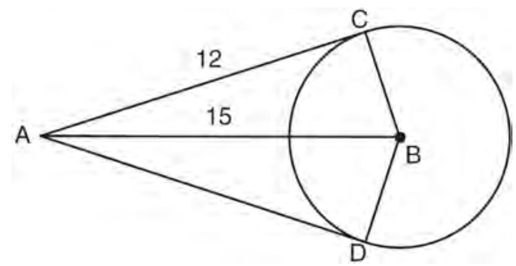
What is the length of $\overline{AP}$?
1 10
2 12
3 17
4 24

476 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°

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

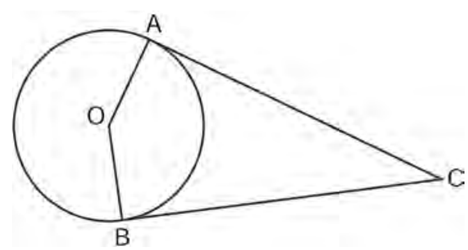


478 In the diagram below, $\overline{AC}$ and $\overline{AD}$ are tangent to circle B at points C and D, respectively, and $\overline{BC}$, $\overline{BD}$, and $\overline{BA}$ are drawn.



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

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

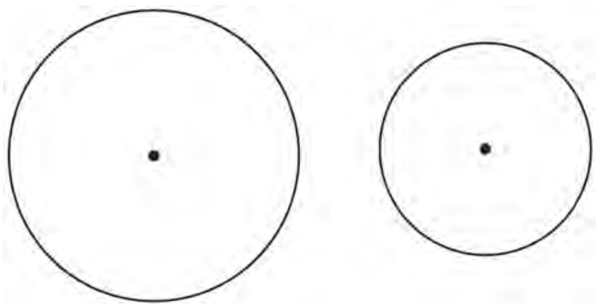


If $m\angle ACB = 38$, what is $m\angle AOB$?
1 71
2 104
3 142
4 161

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

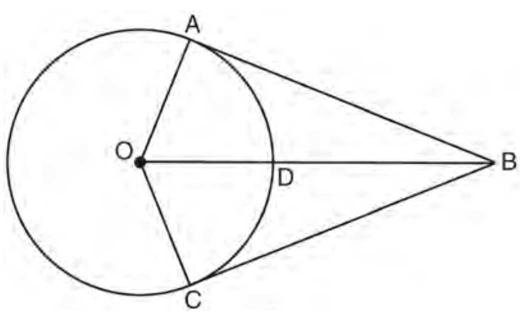
Geometry Regents Exam Questions by Performance Indicator: Topic

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



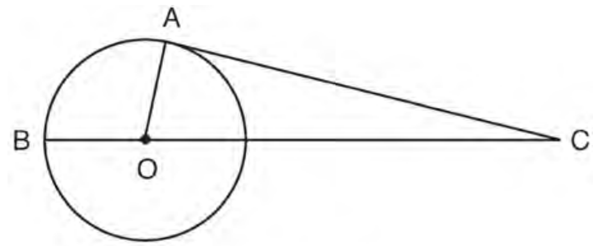
1 1
2 2
3 3
4 4

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



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

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

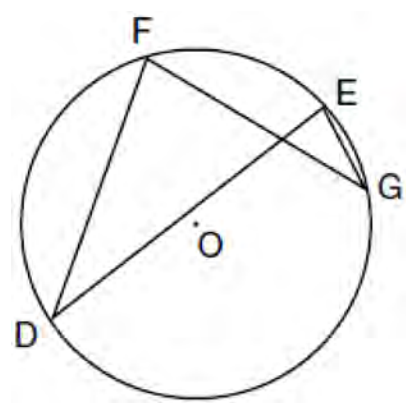


(Not drawn to scale)

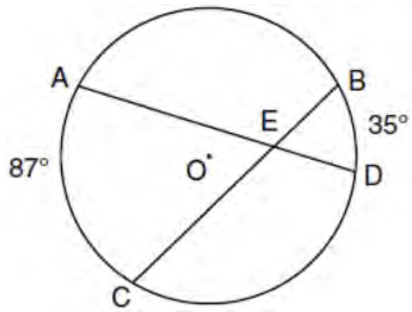
If $AC = 20$ cm and $OA = 7$ cm, what is the length of $\overline{OC}$, to the *nearest centimeter*?
1 19
2 20
3 21
4 27

G.G.51: ARCS DETERMINED BY ANGLES

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

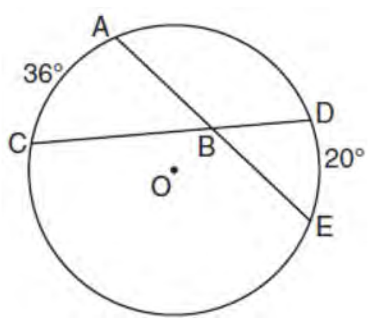


485 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E, $m\overset{\frown}{AC} = 87$, and $m\overset{\frown}{BD} = 35$.



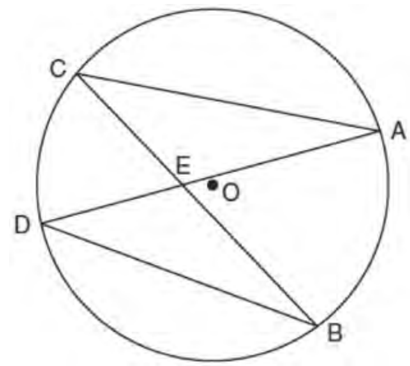
What is the degree measure of $\angle CEA$?
1 87
2 61
3 43.5
4 26

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



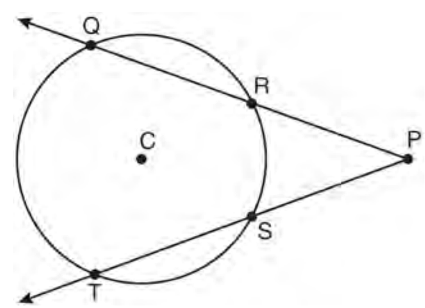
What is $m\angle ABC$?
1 56
2 36
3 28
4 8

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



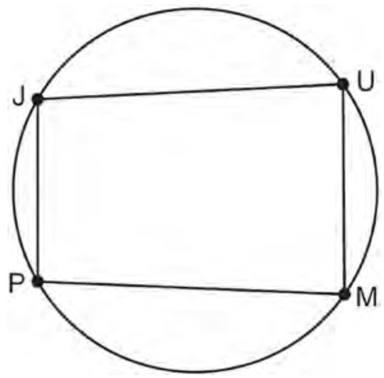
Which relationship must be true?
1 $\triangle CAE \cong \triangle DBE$
2 $\triangle AEC \sim \triangle BED$
3 $\angle ACB \cong \angle CBD$
4 $\overset{\frown}{CA} \cong \overset{\frown}{DB}$

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



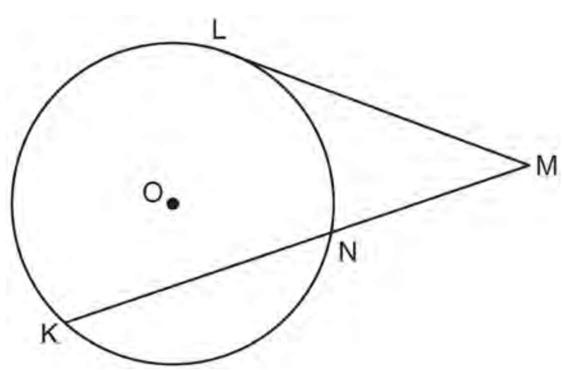
What is $m\overset{\frown}{RS}$?
1 50
2 60
3 90
4 110

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

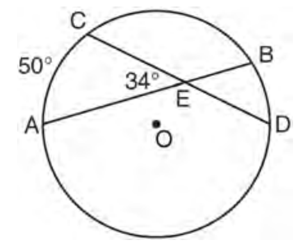


Opposite angles J and M must be
1 right
2 complementary
3 congruent
4 supplementary

490 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 $m\angle LMK$.

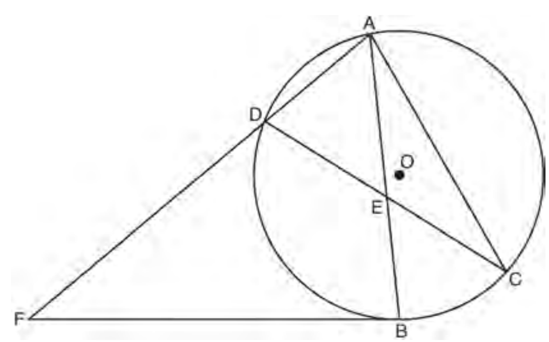


491 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



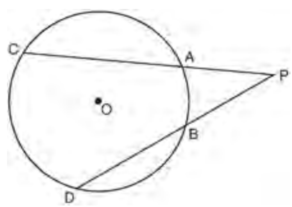
If $m\angle AEC = 34$ and $m\overset{\frown}{AC} = 50$, what is $m\overset{\frown}{DB}$?
1 16
2 18
3 68
4 118

492 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 $m\overset{\frown}{AC} : m\overset{\frown}{CB} = 3:1$.



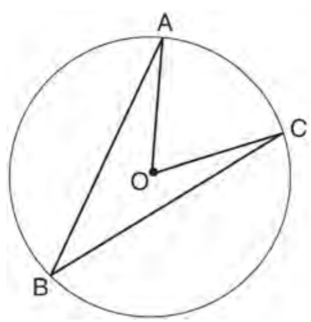
Determine $m\angle CEB$. Determine $m\angle F$. Determine $m\angle DAC$.

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



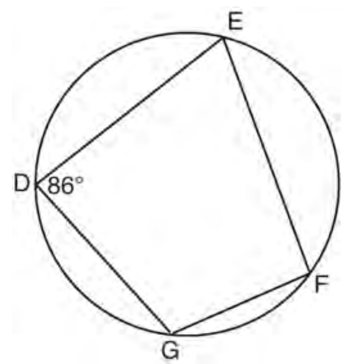
If $m\overset{\frown}{CD} = 70$ and $m\overset{\frown}{AB} = 20$, what is the degree measure of $\angle P$?
1 25
2 35
3 45
4 50

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



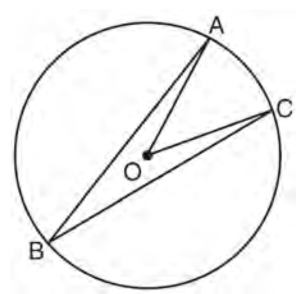
What is the ratio of $m\angle AOC$ to $m\angle ABC$?
1 1 : 1
2 2 : 1
3 3 : 1
4 1 : 2

495 As shown in the diagram below, quadrilateral $DEFG$ is inscribed in a circle and $m\angle D = 86$.



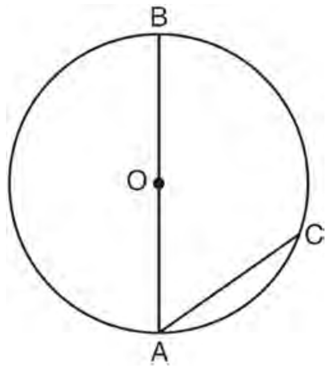
Determine and state $m\overset{\frown}{GFE}$. Determine and state $m\angle F$.

496 In the diagram below of circle O, $m\angle ABC = 24$.



What is the $m\angle AOC$?
1 12
2 24
3 48
4 60

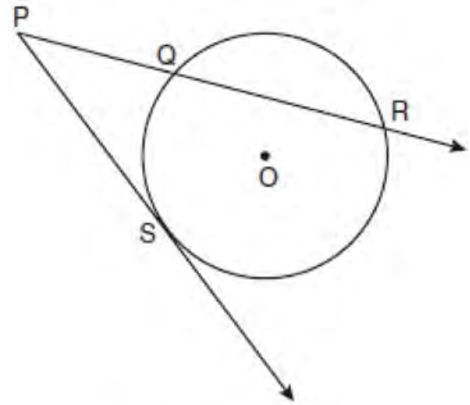
497 As shown in the diagram below, $\overline{AB}$ is a diameter of circle O, and chord $\overline{AC}$ is drawn.



If m$\angle BAC = 70$, then m$\overset{\frown}{AC}$ is
1 40
2 70
3 110
4 140

G.G.53: SEGMENTS INTERCEPTED BY CIRCLE

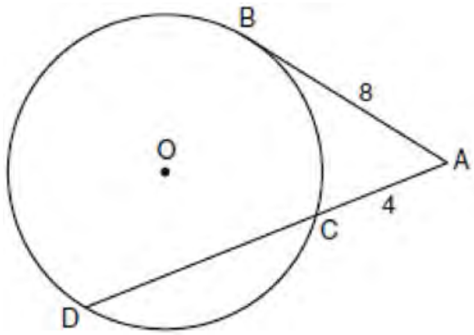
498 In the diagram below, $\overline{PS}$ is a tangent to circle O at point S, $\overline{PQR}$ is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$.



(Not drawn to scale)

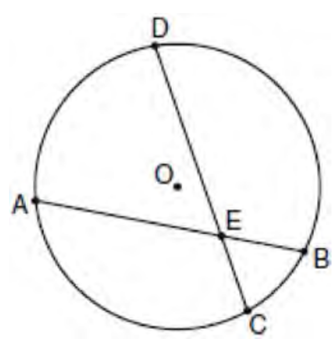
What is the length of $\overline{PS}$?
1 6
2 9
3 3
4 27

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



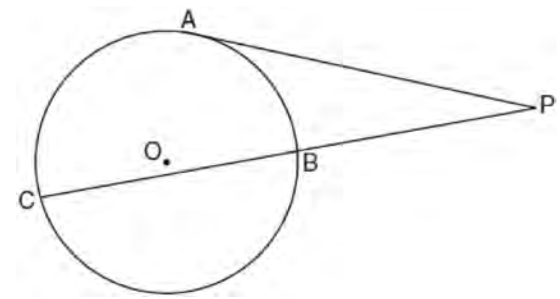
What is the length of $\overline{CD}$?
1 16
2 13
3 12
4 10

500 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 $EB = 4$.



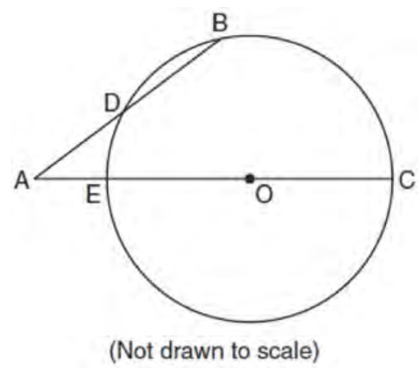
What is the value of x?
1 1
2 3.6
3 5
4 10.25

501 In the diagram below, tangent $\overline{PA}$ and secant $\overline{PBC}$ are drawn to circle O from external point P.



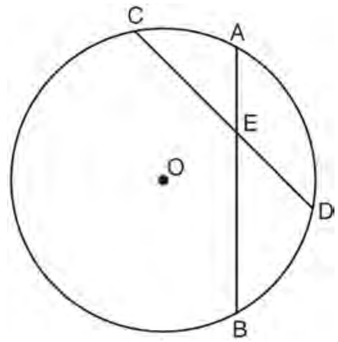
If $PB = 4$ and $BC = 5$, what is the length of $\overline{PA}$?
1 20
2 9
3 8
4 6

502 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 $DB = 6$.



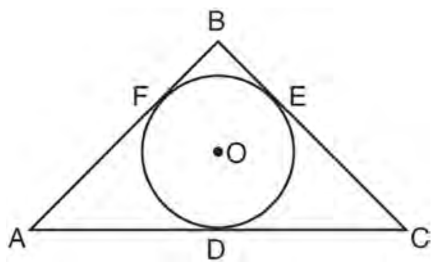
What is the length of $\overline{OC}$?
1 4.5
2 7
3 9
4 14

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



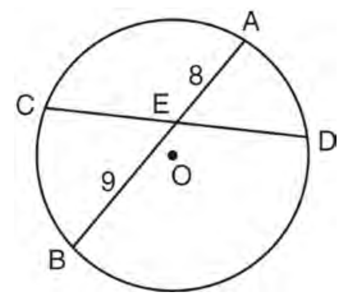
If $CE = 10$, $ED = 6$, and $AE = 4$, what is the length of $\overline{EB}$?
1 15
2 12
3 6.7
4 2.4

504 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 $BE = 4$.

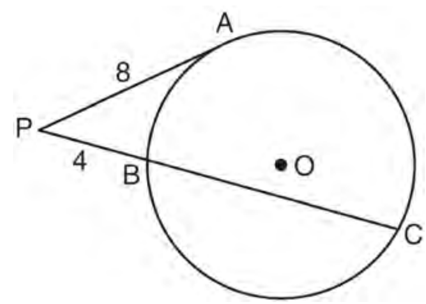


What is the perimeter of $\triangle ABC$?
1 15
2 25
3 30
4 60

505 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.

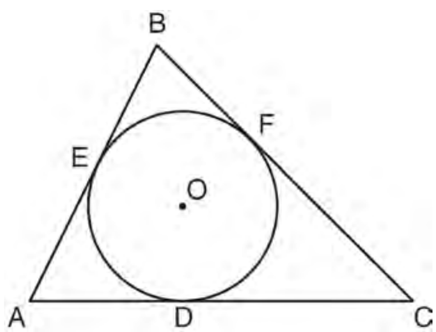


506 In the diagram below of circle O, $\overline{PA}$ is tangent to circle O at A, and $\overline{PBC}$ is a secant with points B and C on the circle.



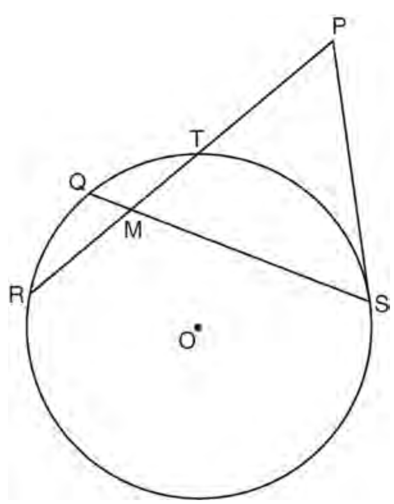
If $PA = 8$ and $PB = 4$, what is the length of $\overline{BC}$?
1 20
2 16
3 15
4 12

507 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

508 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 $PT = 8$.

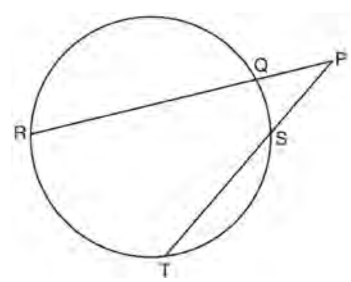


Find the length of $\overline{RT}$. Find the length of $\overline{PS}$.

509 Secants $\overline{JKL}$ and $\overline{JMN}$ are drawn to circle O from an external point, J. If $JK = 8$, $LK = 4$, and $JM = 6$, what is the length of $\overline{JN}$?
1 16
2 12
3 10
4 8

510 Chords $\overline{AB}$ and $\overline{CD}$ intersect at point E in a circle with center at O. If $AE = 8$, $AB = 20$, and $DE = 16$, what is the length of $\overline{CE}$?
1 6
2 9
3 10
4 12

511 In the diagram below, secants $\overline{PQR}$ and $\overline{PST}$ are drawn to a circle from point P.



If $PR = 24$, $PQ = 6$, and $PS = 8$, determine and state the length of $\overline{PT}$.

G.G.71: EQUATIONS OF CIRCLES

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

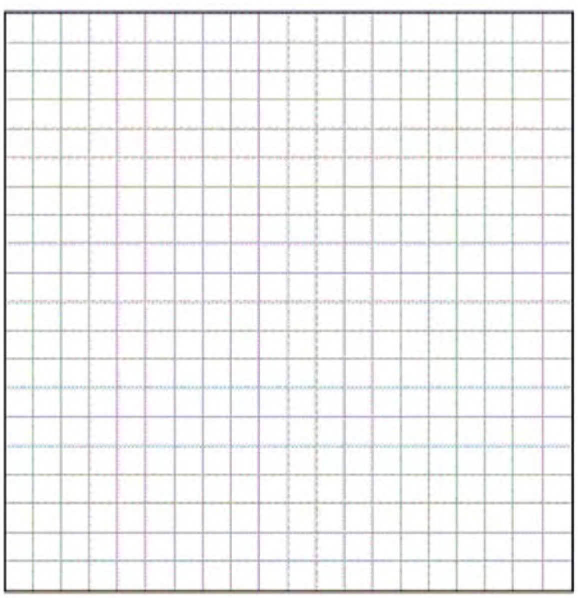
513 What is an equation of a circle with its center at $(-3,5)$ and a radius of 4?

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

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

515 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.]



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

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

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

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

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

521 Write an equation of a circle whose center is $(-3,2)$ and whose diameter is 10.

522 Which equation represents the circle whose center is $(-5,3)$ and that passes through the point $(-1,3)$?

1 $(x+1)^2+(y-3)^2=16$
2 $(x-1)^2+(y+3)^2=16$
3 $(x+5)^2+(y-3)^2=16$
4 $(x-5)^2+(y+3)^2=16$

523 What is an equation of the circle with center $(-5,4)$ and a radius of 7?

1 $(x-5)^2+(y+4)^2=14$
2 $(x-5)^2+(y+4)^2=49$
3 $(x+5)^2+(y-4)^2=14$
4 $(x+5)^2+(y-4)^2=49$

524 What is the equation of the circle with its center at $(-1,2)$ and that passes through the point $(1,2)$?

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

525 The coordinates of the endpoints of the diameter of a circle are $(2,0)$ and $(2,-8)$. What is the equation of the circle?

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

526 A circle whose center has coordinates $(-3,4)$ passes through the origin. What is the equation of the circle?

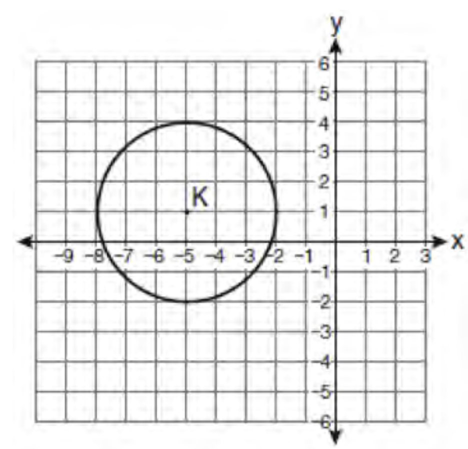
1 $(x+3)^2+(y-4)^2=5$
2 $(x+3)^2+(y-4)^2=25$
3 $(x-3)^2+(y+4)^2=5$
4 $(x-3)^2+(y+4)^2=25$

527 Which equation represents a circle whose center is the origin and that passes through the point $(-4,0)$?

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

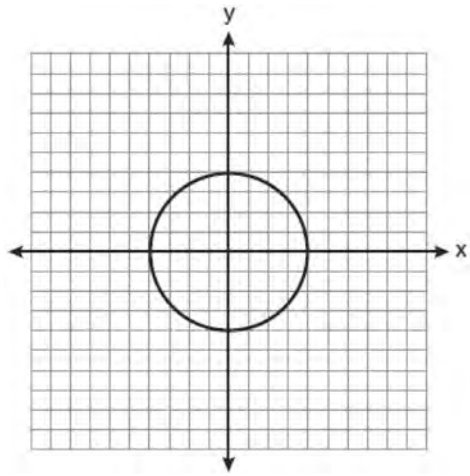
G.G.72: EQUATIONS OF CIRCLES

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



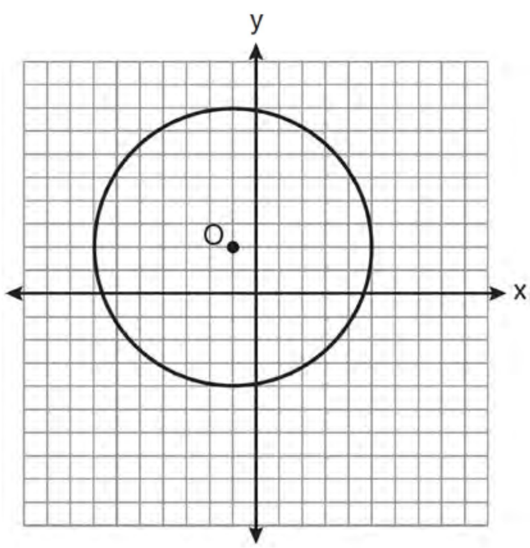
1 $(x+5)^2+(y-1)^2=3$
2 $(x+5)^2+(y-1)^2=9$
3 $(x-5)^2+(y+1)^2=3$
4 $(x-5)^2+(y+1)^2=9$

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

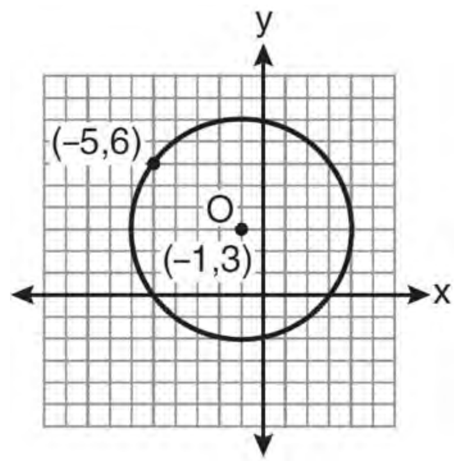


1 $x^2 + y^2 = 2$
2 $x^2 + y^2 = 4$
3 $x^2 + y^2 = 8$
4 $x^2 + y^2 = 16$

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

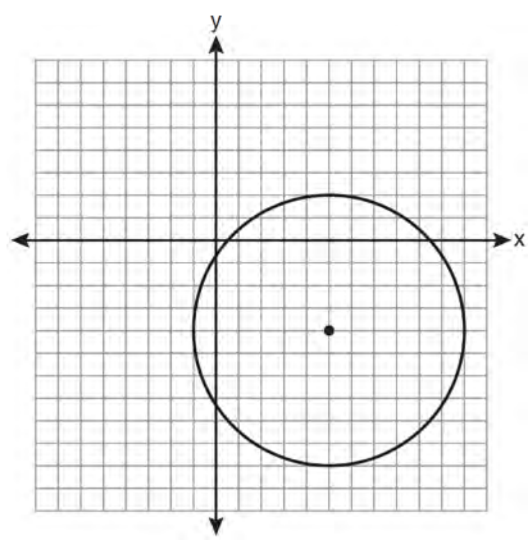


531 What is an equation of circle O shown in the graph below?

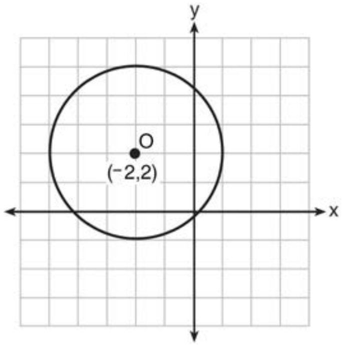


1 $(x+1)^2 + (y-3)^2 = 25$
2 $(x-1)^2 + (y+3)^2 = 25$
3 $(x-5)^2 + (y+6)^2 = 25$
4 $(x+5)^2 + (y-6)^2 = 25$

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

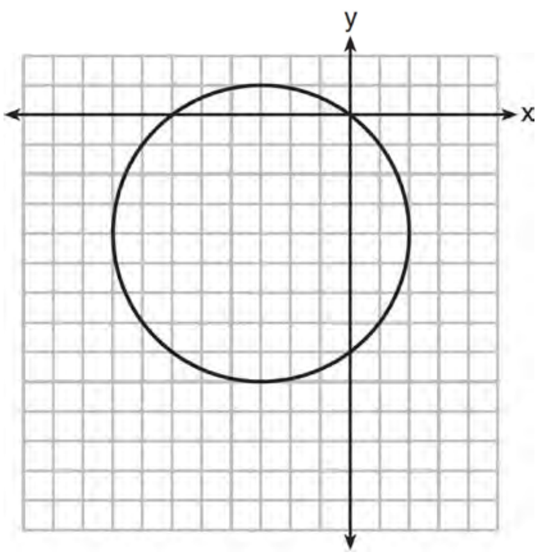


533 What is an equation of circle O shown in the graph below?



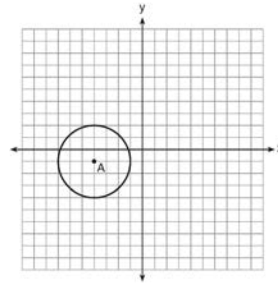
1 $(x+2)^2+(y-2)^2=9$
2 $(x+2)^2+(y-2)^2=3$
3 $(x-2)^2+(y+2)^2=9$
4 $(x-2)^2+(y+2)^2=3$

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



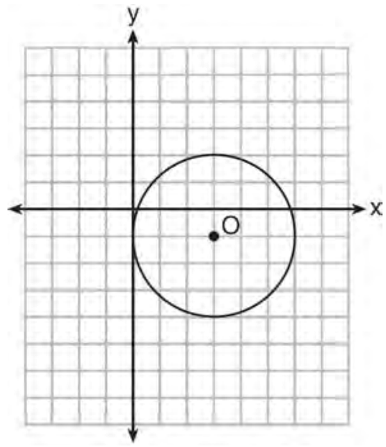
1 $(x-3)^2+(y-4)^2=25$
2 $(x+3)^2+(y+4)^2=25$
3 $(x-3)^2+(y-4)^2=10$
4 $(x+3)^2+(y+4)^2=10$

535 Which equation represents circle A shown in the diagram below?



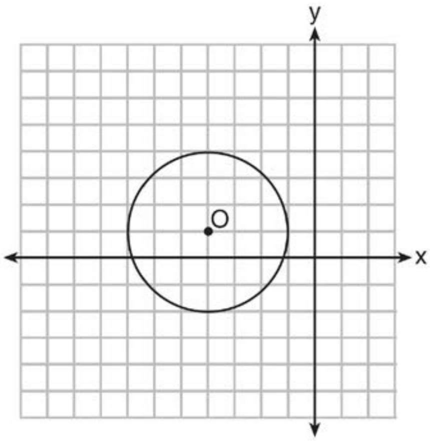
1 $(x-4)^2+(y-1)^2=3$
2 $(x+4)^2+(y+1)^2=3$
3 $(x-4)^2+(y-1)^2=9$
4 $(x+4)^2+(y+1)^2=9$

536 What is the equation for circle O shown in the graph below?



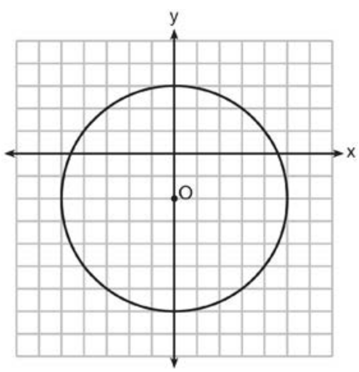
1 $(x-3)^2+(y+1)^2=6$
2 $(x+3)^2+(y-1)^2=6$
3 $(x-3)^2+(y+1)^2=9$
4 $(x+3)^2+(y-1)^2=9$

537 What is the equation of circle O shown in the diagram below?



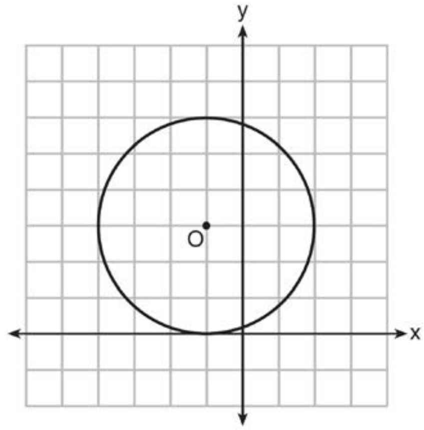
1 $(x+4)^2+(y-1)^2=3$
2 $(x-4)^2+(y+1)^2=3$
3 $(x+4)^2+(y-1)^2=9$
4 $(x-4)^2+(y+1)^2=9$

538 Which equation represents circle O shown in the graph below?



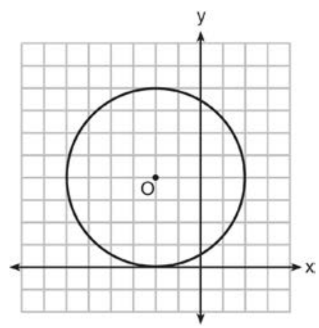
1 $x^2+(y-2)^2=10$
2 $x^2+(y+2)^2=10$
3 $x^2+(y-2)^2=25$
4 $x^2+(y+2)^2=25$

539 Circle O is graphed on the set of axes below. Which equation represents circle O?



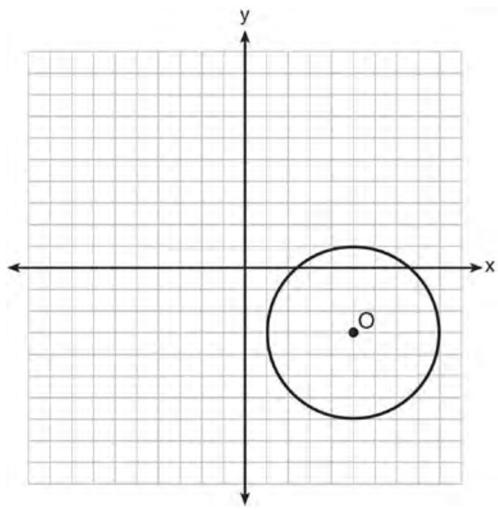
1 $(x+1)^2+(y-3)^2=9$
2 $(x-1)^2+(y+3)^2=9$
3 $(x+1)^2+(y-3)^2=6$
4 $(x-1)^2+(y+3)^2=6$

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



1 $(x-2)^2+(y+4)^2=4$
2 $(x-2)^2+(y+4)^2=16$
3 $(x+2)^2+(y-4)^2=4$
4 $(x+2)^2+(y-4)^2=16$

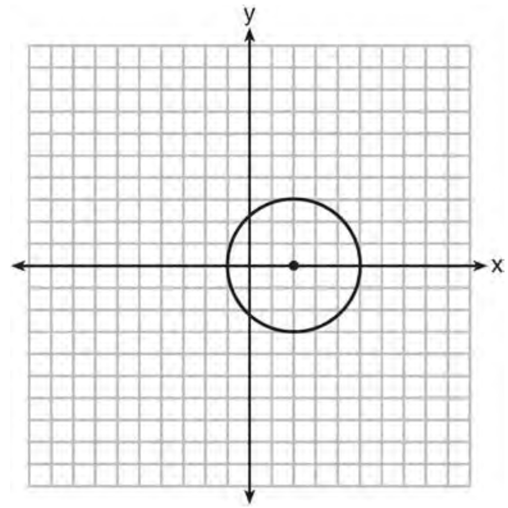
541 The diagram below is a graph of circle *O*.



Which equation represents circle *O*?

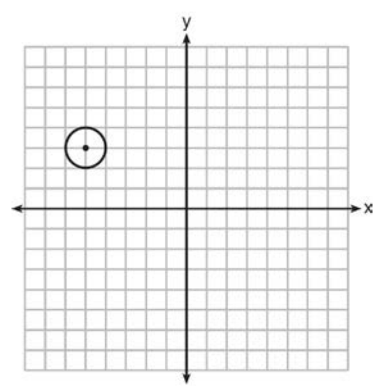
1 $(x-5)^2+(y+3)^2=4$
2 $(x+5)^2+(y-3)^2=4$
3 $(x-5)^2+(y+3)^2=16$
4 $(x+5)^2+(y-3)^2=16$

542 Which equation represents the circle shown in the graph below?



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

543 Which equation represents the circle shown in the graph below?



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

G.G.73: EQUATIONS OF CIRCLES

544 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 = $\sqrt{C}$

545 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 $\sqrt{13}$

546 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

547 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

548 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

549 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

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

551 The equation of a circle is $(x-2)^2+(y+5)^2=32$. What are the coordinates of the center of this circle and the length of its radius?
1 $(-2,5)$ and 16
2 $(2,-5)$ and 16
3 $(-2,5)$ and $4\sqrt{2}$
4 $(2,-5)$ and $4\sqrt{2}$

552 Which set of equations represents two circles that have the same center?
1 $x^2+(y+4)^2=16$ and $(x+4)^2+y^2=16$
2 $(x+3)^2+(y-3)^2=16$ and $(x-3)^2+(y+3)^2=25$
3 $(x-7)^2+(y-2)^2=16$ and $(x+7)^2+(y+2)^2=25$
4 $(x-2)^2+(y-5)^2=16$ and $(x-2)^2+(y-5)^2=25$

553 A circle has the equation $(x-3)^2+(y+4)^2=10$. Find the coordinates of the center of the circle and the length of the circle's radius.

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

555 A circle with the equation $(x+6)^2+(y-7)^2=64$ does *not* include points in Quadrant
1 I
2 II
3 III
4 IV

556 The equation of a circle is $(x-3)^2+y^2=8$. The coordinates of its center and the length of its radius are
1 $(-3,0)$ and 4
2 $(3,0)$ and 4
3 $(-3,0)$ and $2\sqrt{2}$
4 $(3,0)$ and $2\sqrt{2}$

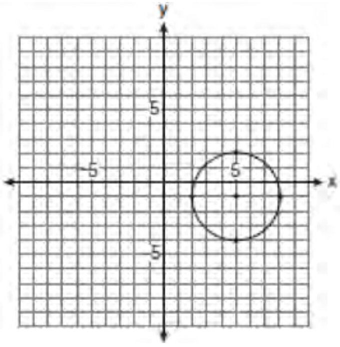
557 Circle O is represented by the equation $(x+3)^2+(y-5)^2=48$. The coordinates of the center and the length of the radius of circle O are
1 $(-3,5)$ and $4\sqrt{3}$
2 $(-3,5)$ and 24
3 $(3,-5)$ and $4\sqrt{3}$
4 $(3,-5)$ and 24

558 Students made four statements about a circle.
A: The coordinates of its center are $(4,-3)$.
B: The coordinates of its center are $(-4,3)$.
C: The length of its radius is $5\sqrt{2}$.
D: The length of its radius is 25.
If the equation of the circle is $(x+4)^2+(y-3)^2=50$, which statements are correct?
1 *A* and *C*
2 *A* and *D*
3 *B* and *C*
4 *B* and *D*

559 In a circle whose equation is $(x-1)^2+(y+3)^2=9$, the coordinates of the center and length of its radius are
1 $(1,-3)$ and $r=81$
2 $(-1,3)$ and $r=81$
3 $(1,-3)$ and $r=3$
4 $(-1,3)$ and $r=3$

G.G.74: GRAPHING CIRCLES

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



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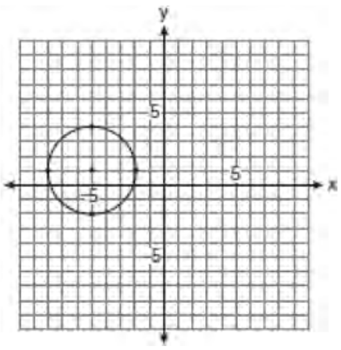

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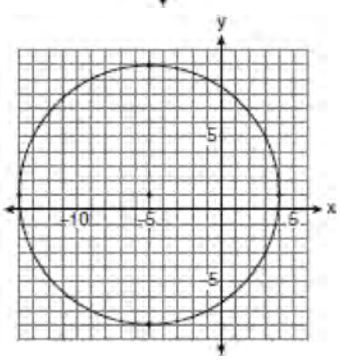

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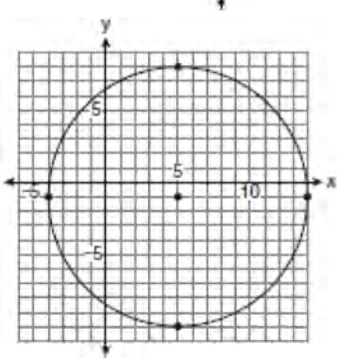

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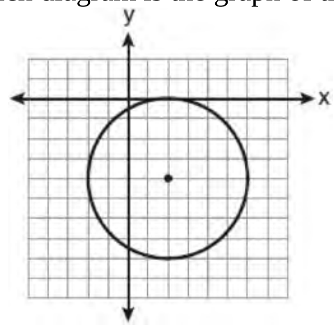
561 The equation of a circle is $(x-2)^2+(y+4)^2=4$. Which diagram is the graph of the circle?



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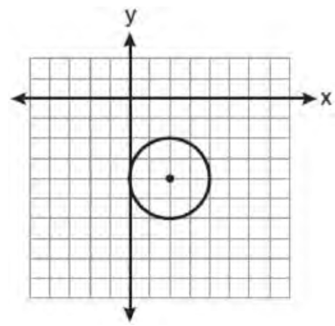

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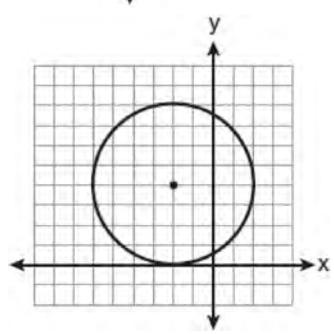

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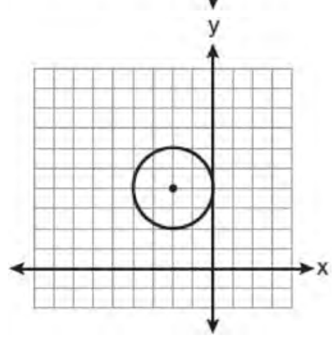
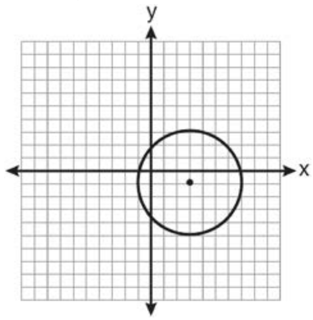


4

562 Which graph represents a circle with the equation $(x-3)^2 + (y+1)^2 = 4$?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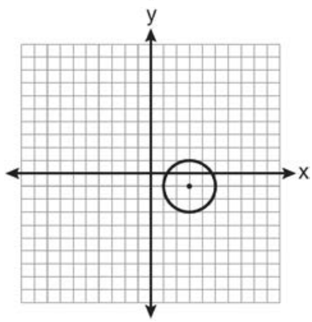
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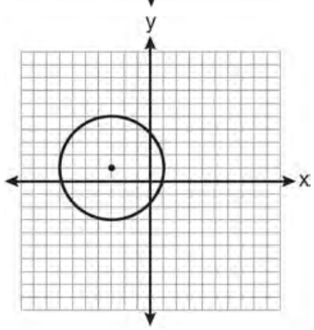
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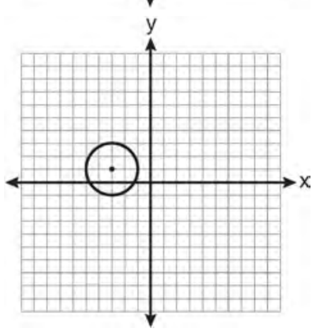
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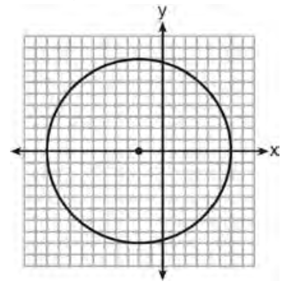
563 Which graph represents a circle whose equation is $(x+2)^2 + y^2 = 16$?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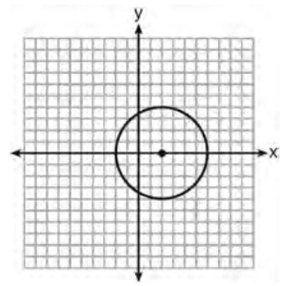
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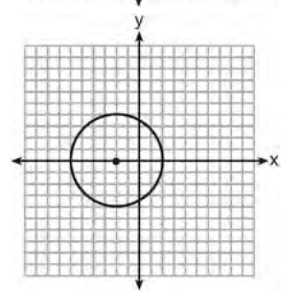
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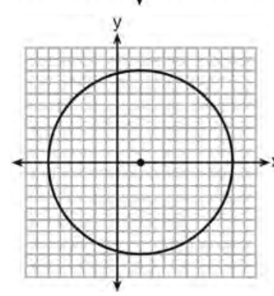
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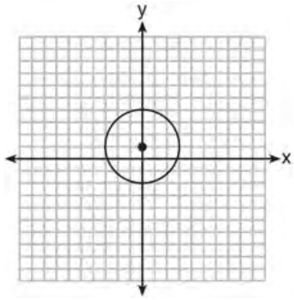
564 Which graph represents a circle whose equation is $x^2 + (y-1)^2 = 9$?



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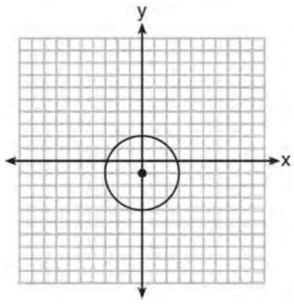

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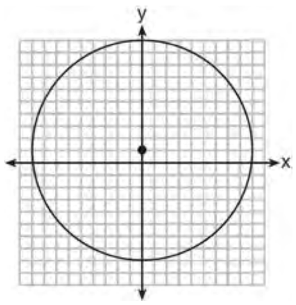

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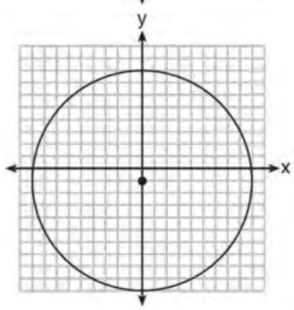
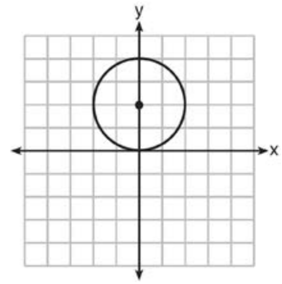


4

565 Which graph represents a circle whose equation is $x^2 + (y-2)^2 = 4$?



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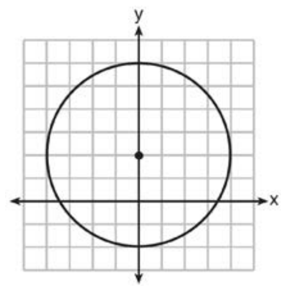

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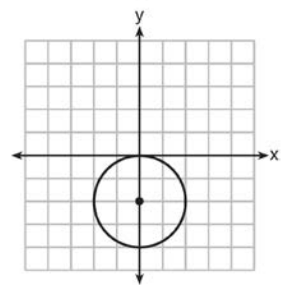

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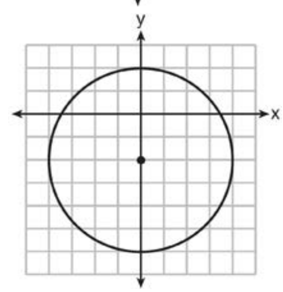
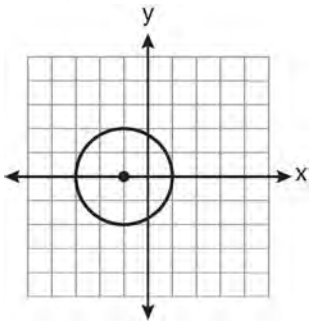


4

566 Which graph represents the graph of the equation $(x-1)^2 + y^2 = 4$?



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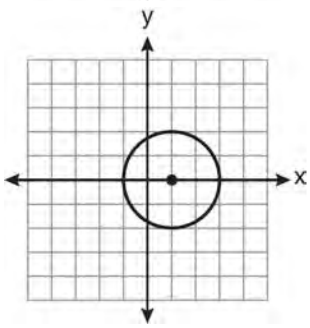

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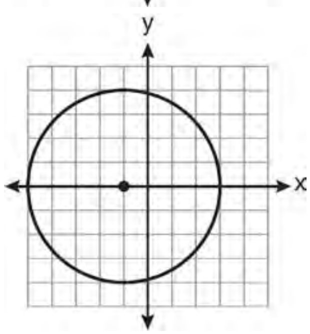

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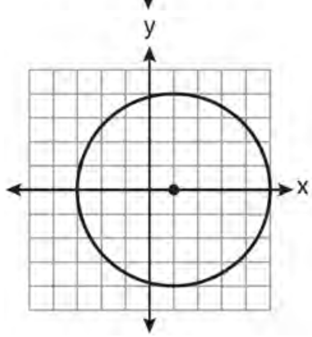

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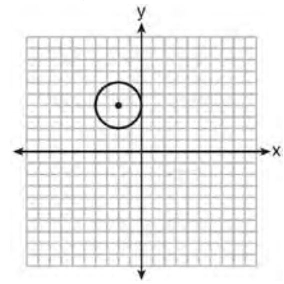
567 Which graph represents a circle whose equation is $(x-2)^2 + (y+4)^2 = 4$?



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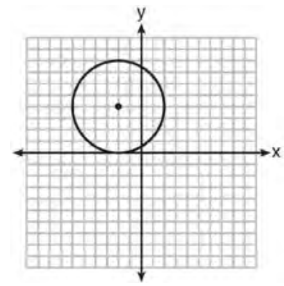

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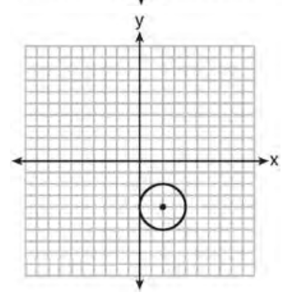

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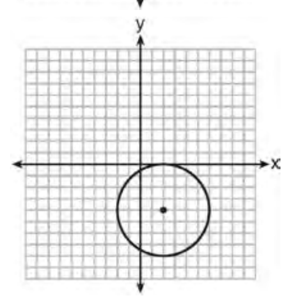
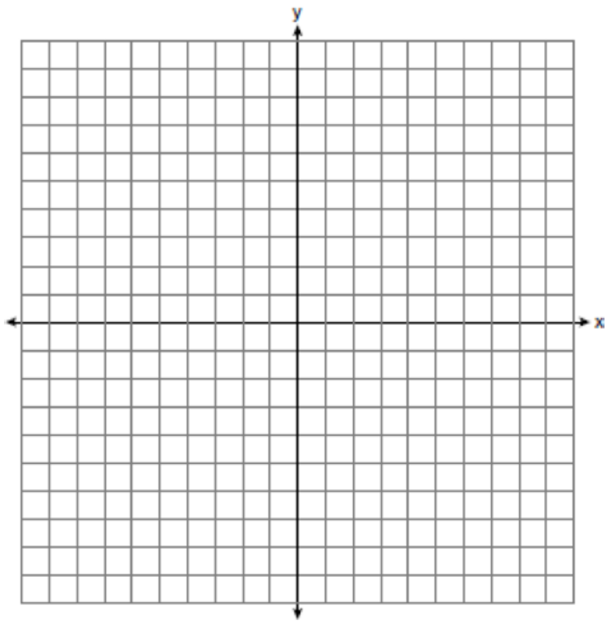


4

568 On the set of axes below, graph and label circle A whose equation is $(x+4)^2+(y-2)^2=16$ and circle B whose equation is $x^2+y^2=9$. Determine, in simplest radical form, the length of the line segment with endpoints at the centers of circles A and B.



MEASURING IN THE PLANE AND SPACE

G.G.11: VOLUME

569 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.

570 A rectangular prism has a base with a length of 25, a width of 9, and a height of 12. A second prism has a square base with a side of 15. If the volumes of the two prisms are equal, what is the height of the second prism?
1 6
2 8
3 12
4 15

571 Two prisms have equal heights and equal volumes. The base of one is a pentagon and the base of the other is a square. If the area of the pentagonal base is 36 square inches, how many inches are in the length of each side of the square base?
1 6
2 9
3 24
4 36

572 Two prisms with equal altitudes have equal volumes. The base of one prism is a square with a side length of 5 inches. The base of the second prism is a rectangle with a side length of 10 inches. Determine and state, in inches, the measure of the width of the rectangle.

573 A carpenter made a storage container in the shape of a rectangular prism. It is 5 feet high and has a volume of 720 cubic feet. He wants to make a second container with the same height and volume as the first one, but in the shape of a triangular prism. What will be the number of square feet in the area of the base of the new container?
1 36
2 72
3 144
4 288

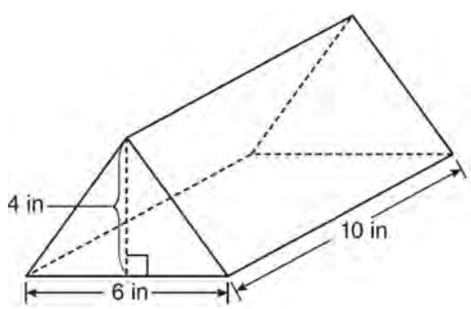
G.G.12: VOLUME

574 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

575 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.

576 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

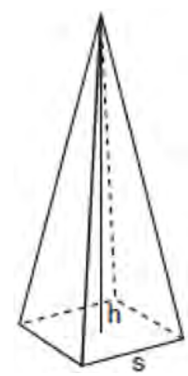
577 The volume of a rectangular prism is 144 cubic inches. The height of the prism is 8 inches. Which measurements, in inches, could be the dimensions of the base?

1 3.3 by 5.5
2 2.5 by 7.2
3 12 by 8
4 9 by 9

578 A right prism has a square base with an area of 12 square meters. The volume of the prism is 84 cubic meters. Determine and state the height of the prism, in meters.

G.G.13: VOLUME

579 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?

580 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.

581 A regular pyramid has a height of 12 centimeters and a square base. If the volume of the pyramid is 256 cubic centimeters, how many centimeters are in the length of one side of its base?

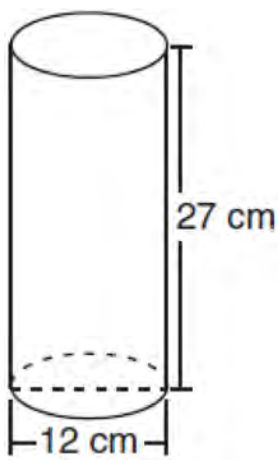
1 8
2 16
3 32
4 64

G.G.14: VOLUME AND LATERAL AREA

582 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*.

583 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

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



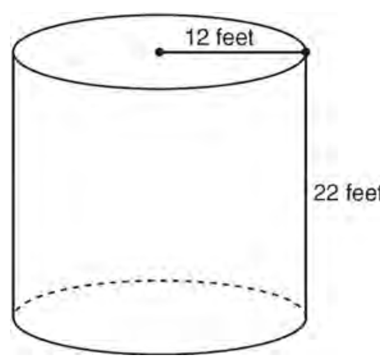
1 162π
2 324π
3 972π
4 $3,888\pi$

585 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

586 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 $2,160\pi$

587 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.

588 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?



589 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.

590 A right circular cylinder with a height of 5 cm has a base with a diameter of 6 cm. Find the lateral area of the cylinder to the *nearest hundredth of a square centimeter*. Find the volume of the cylinder to the *nearest hundredth of a cubic centimeter*.

591 A right circular cylinder has a height of 7 inches and the base has a diameter of 6 inches. Determine the lateral area, in square inches, of the cylinder in terms of π.

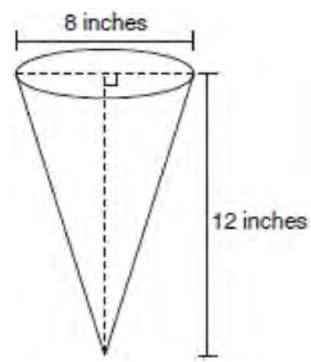
592 As shown in the diagram below, a landscaper uses a cylindrical lawn roller on a lawn. The roller has a radius of 9 inches and a width of 42 inches.

To the *nearest square inch*, the area the roller covers in one complete rotation is
1 2,374
2 2,375
3 10,682
4 10,688

593 The diameter of the base of a right circular cylinder is 6 cm and its height is 15 cm. In square centimeters, the lateral area of the cylinder is
1 180π
2 135π
3 90π
4 45π

G.G.15: VOLUME AND LATERAL AREA

594 In the diagram below, a right circular cone has a diameter of 8 inches and a height of 12 inches.

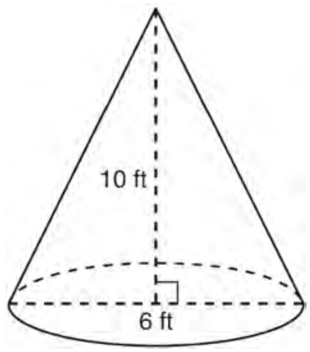


What is the volume of the cone to the *nearest cubic inch*?
1 201
2 481
3 603
4 804

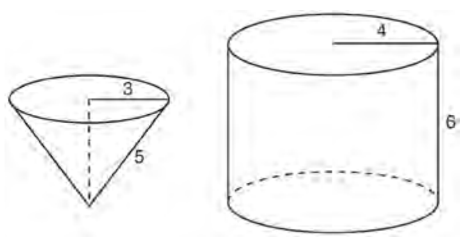
595 A right circular cone has a base with a radius of 15 cm, a vertical height of 20 cm, and a slant height of 25 cm. Find, in terms of' π, the number of square centimeters in the lateral area of the cone.

596 The lateral area of a right circular cone is equal to 120π cm^2. If the base of the cone has a diameter of 24 cm, what is the length of the slant height, in centimeters?
1 2.5
2 5
3 10
4 15.7

597 A right circular cone has an altitude of 10 ft and the diameter of the base is 6 ft as shown in the diagram below. Determine and state the lateral area of the cone, to the *nearest tenth of a square foot*.

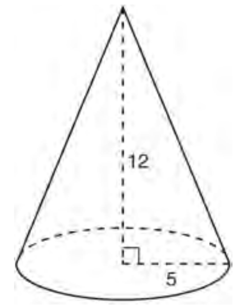


598 In the diagram below, a right circular cone with a radius of 3 inches has a slant height of 5 inches, and a right cylinder with a radius of 4 inches has a height of 6 inches.



Determine and state the number of full cones of water needed to completely fill the cylinder with water.

599 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



Determine, in terms of π, the lateral area of the right circular cone.

600 A paper container in the shape of a right circular cone has a radius of 3 inches and a height of 8 inches. Determine and state the number of cubic inches in the volume of the cone, in terms of π.

G.G.16: VOLUME AND SURFACE AREA

601 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*.

602 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

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

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

605 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

606 A sphere is inscribed inside a cube with edges of 6 cm. In cubic centimeters, what is the volume of the sphere, in terms of π?
1 12π
2 36π
3 48π
4 288π

607 The volume of a sphere is approximately 44.6022 cubic centimeters. What is the radius of the sphere, to the *nearest tenth of a centimeter*?
1 2.2
2 3.3
3 4.4
4 4.7

608 The diameter of a sphere is 5 inches. Determine and state the surface area of the sphere, to the *nearest hundredth of a square inch*.

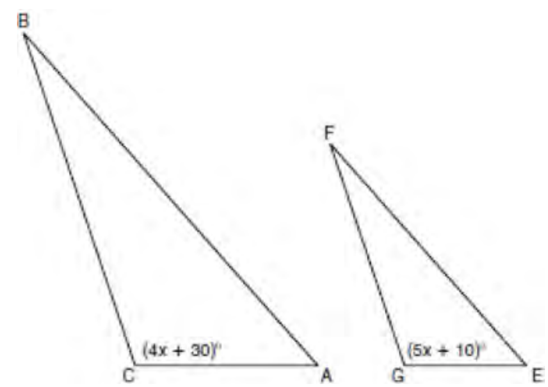
609 If the surface area of a sphere is 144π square centimeters, what is the length of the diameter of the sphere, in centimeters?
1 36
2 18
3 12
4 6

610 The diameter of a sphere is 12 inches. What is the volume of the sphere to the *nearest cubic inch*?
1 288
2 452
3 905
4 7,238

G.G.45: SIMILARITY

611 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 $2:1$.

612 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.

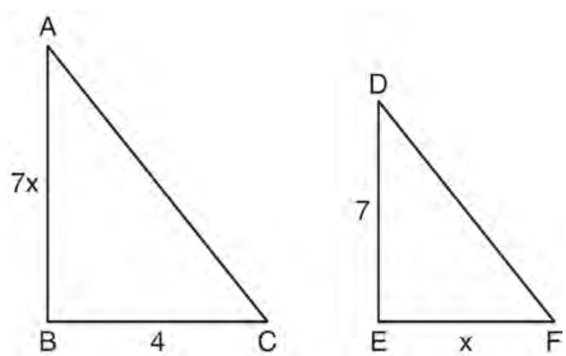


613 Given $\triangle ABC \sim \triangle DEF$ such that $\frac{AB}{DE} = \frac{3}{2}$. Which statement is *not* true?
1 $\frac{BC}{EF} = \frac{3}{2}$
2 $\frac{m\angle A}{m\angle D} = \frac{3}{2}$
3 $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF} = \frac{9}{4}$
4 $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$

614 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

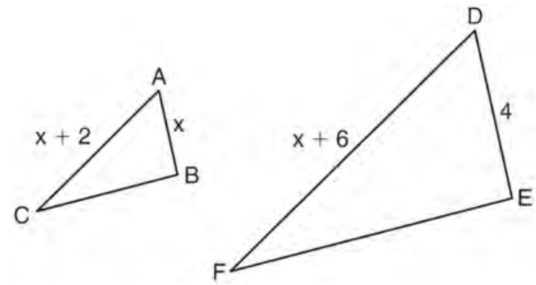
615 $\triangle ABC$ is similar to $\triangle DEF$. The ratio of the length of $\overline{AB}$ to the length of $\overline{DE}$ is $3:1$. Which ratio is also equal to $3:1$?
1 $\dfrac{m\angle A}{m\angle D}$
2 $\dfrac{m\angle B}{m\angle F}$
3 $\dfrac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$
4 $\dfrac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$

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

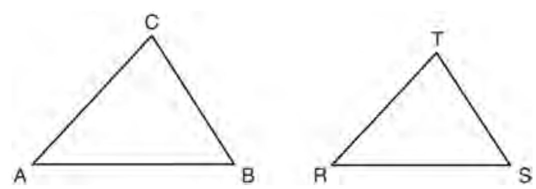


What is the length of $\overline{AB}$?
1 28
2 2
3 14
4 4

617 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.]



618 In the diagram below, $\triangle ABC \sim \triangle RST$.



Which statement is *not* true?
1 $\angle A \cong \angle R$
2 $\dfrac{AB}{RS} = \dfrac{BC}{ST}$
3 $\dfrac{AB}{BC} = \dfrac{ST}{RS}$
4 $\dfrac{AB+BC+AC}{RS+ST+RT} = \dfrac{AB}{RS}$

619 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 $\angle ABC \cong \angle EDF$

620 Triangle ABC is similar to triangle DEF. The lengths of the sides of $\triangle ABC$ are 5, 8, and 11. What is the length of the shortest side of $\triangle DEF$ if its perimeter is 60?

1 10
2 12.5
3 20
4 27.5

621 If $\triangle RST \sim \triangle ABC$, $m\angle A = x^2 - 8x$, $m\angle C = 4x - 5$, and $m\angle R = 5x + 30$, find $m\angle C$. [Only an algebraic solution can receive full credit.]

622 The sides of a triangle are 8, 12, and 15. The longest side of a similar triangle is 18. What is the ratio of the perimeter of the smaller triangle to the perimeter of the larger triangle?

1 2:3
2 4:9
3 5:6
4 25:36

623 Triangle RST is similar to $\triangle XYZ$ with $RS = 3$ inches and $XY = 2$ inches. If the area of $\triangle RST$ is 27 square inches, determine and state the area of $\triangle XYZ$, in square inches.

624 If $\triangle ABC \sim \triangle LMN$, which statement is *not* always true?

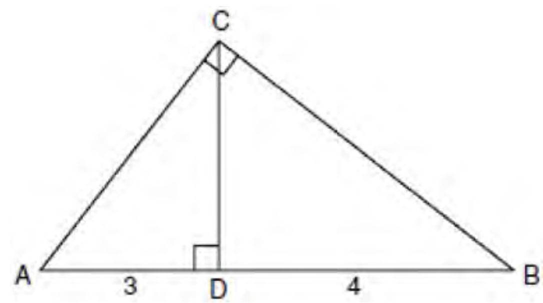
1 $m\angle A \cong m\angle N$
2 $m\angle B \cong m\angle M$
3 $\dfrac{\text{area of } \triangle ABC}{\text{area of } \triangle LMN} = \dfrac{(AC)^2}{(LN)^2}$
4 $\dfrac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle LMN} = \dfrac{AB}{LM}$

625 The corresponding medians of two similar triangles are 8 and 20. If the perimeter of the larger triangle is 45, what is the perimeter of the smaller triangle?

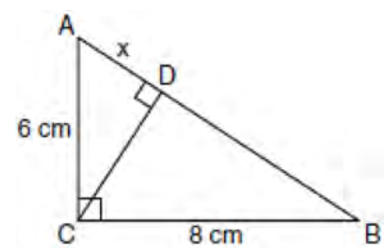
1 14
2 18
3 33
4 37

G.G.47: SIMILARITY

626 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.



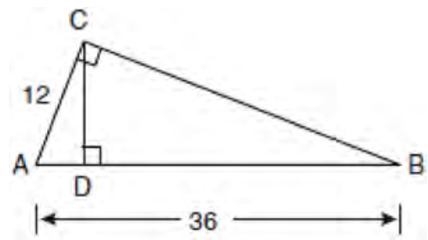
627 In the diagram below, the length of the legs $\overline{AC}$ and $\overline{BC}$ of right triangle ABC are 6 cm and 8 cm, respectively. Altitude $\overline{CD}$ is drawn to the hypotenuse of $\triangle ABC$.



What is the length of $\overline{AD}$ to the *nearest tenth of a centimeter*?

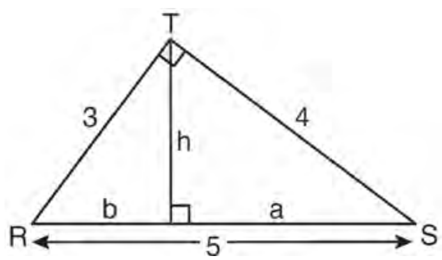
1 3.6
2 6.0
3 6.4
4 4.0

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

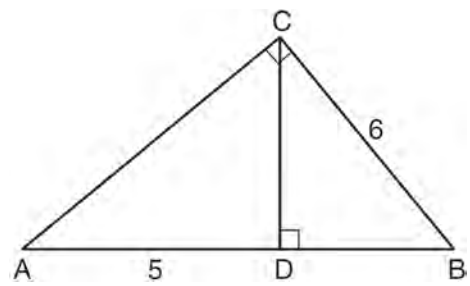


If $AB = 36$ and $AC = 12$, what is the length of $\overline{AD}$?
1 32
2 6
3 3
4 4

629 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.

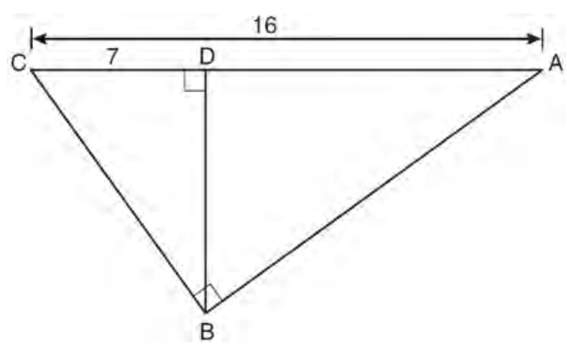


630 In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $CB = 6$, and $AD = 5$.



What is the length of $\overline{BD}$?
1 5
2 9
3 3
4 4

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

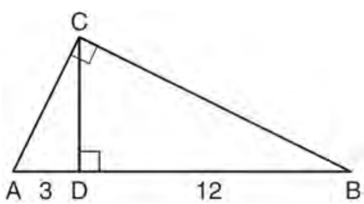


What is the length of $\overline{BD}$?
1 $3\sqrt{7}$
2 $4\sqrt{7}$
3 $7\sqrt{3}$
4 12

632 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

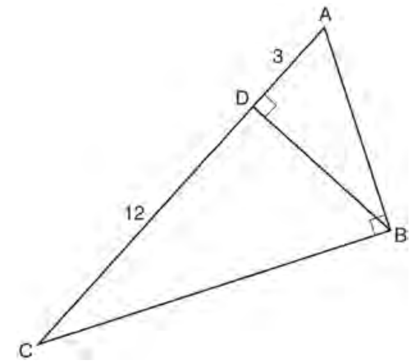
633 In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?

1 6
2 $6\sqrt{5}$
3 3
4 $3\sqrt{5}$

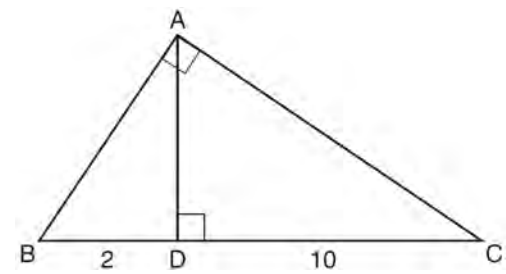
634 In right triangle ABC shown in the diagram below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $CD = 12$, and $AD = 3$.



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

1 $5\sqrt{3}$
2 6
3 $3\sqrt{5}$
4 9

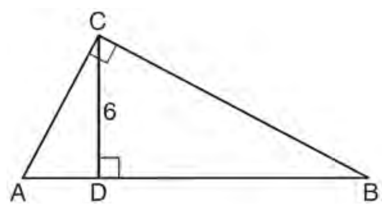
635 Triangle ABC shown below is a right triangle with altitude $\overline{AD}$ drawn to the hypotenuse $\overline{BC}$.



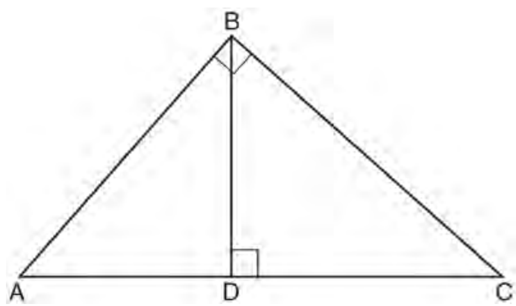
If $BD = 2$ and $DC = 10$, what is the length of $\overline{AB}$?

1 $2\sqrt{2}$
2 $2\sqrt{5}$
3 $2\sqrt{6}$
4 $2\sqrt{30}$

636 In right triangle ABC below, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If $CD = 6$ and the ratio of AD to AB is 1:5, determine and state the length of $\overline{BD}$. [Only an algebraic solution can receive full credit.]

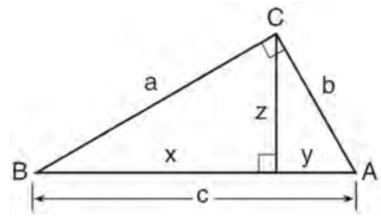


637 In right triangle ABC shown below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.



If $AD = 8$ and $DC = 10$, determine and state the length of $\overline{AB}$.

638 In the diagram below of right triangle ABC, an altitude is drawn to the hypotenuse $\overline{AB}$.



Which proportion would always represent a correct relationship of the segments?

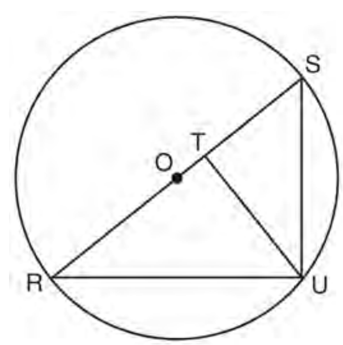
1 $\frac{c}{z} = \frac{z}{y}$

2 $\frac{c}{a} = \frac{a}{y}$

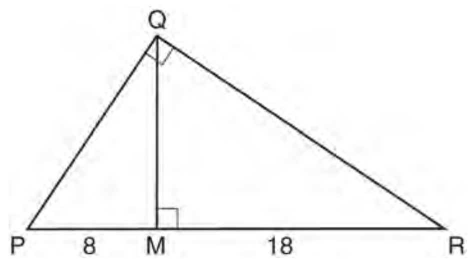
3 $\frac{x}{z} = \frac{z}{y}$

4 $\frac{y}{b} = \frac{b}{x}$

639 In the diagram below, right triangle RSU is inscribed in circle O, and $\overline{UT}$ is the altitude drawn to hypotenuse $\overline{RS}$. The length of $\overline{RT}$ is 16 more than the length of $\overline{TS}$ and $TU = 15$. Find the length of $\overline{TS}$. Find, in simplest radical form, the length of $\overline{RU}$.



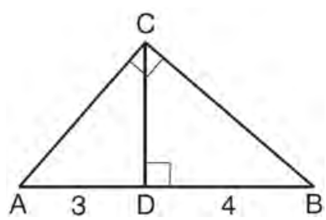
640 In the diagram below, $\overline{QM}$ is an altitude of right triangle PQR, $PM = 8$, and $RM = 18$.



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

1 20
2 16
3 12
4 10

641 In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $AD = 3$, and $DB = 4$.



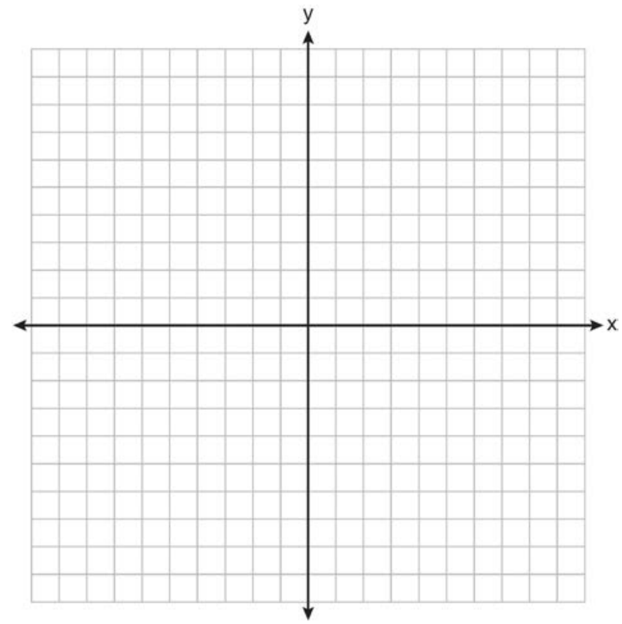
What is the length of $\overline{CB}$?

1 $2\sqrt{3}$
2 $\sqrt{21}$
3 $2\sqrt{7}$
4 $4\sqrt{3}$

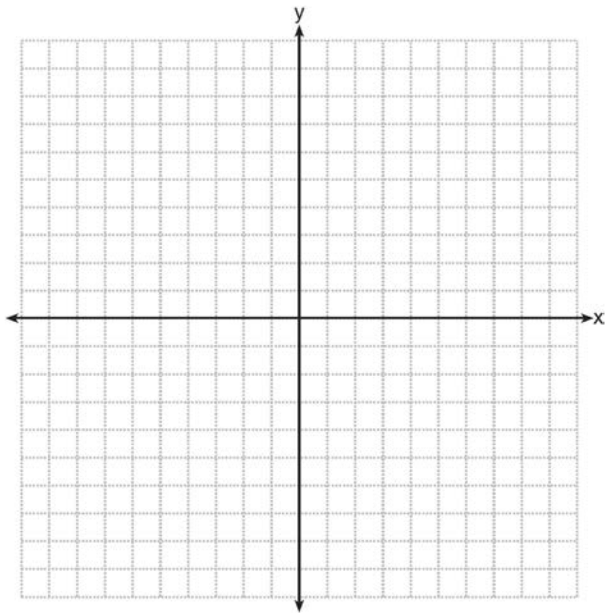
TRANSFORMATIONS

G.G.54: ROTATIONS

642 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.]



643 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.]



644 What are the coordinates of A', the image of $A(-3,4)$, after a rotation of 180º about the origin?
1 $(4,-3)$
2 $(-4,-3)$
3 $(3,4)$
4 $(3,-4)$

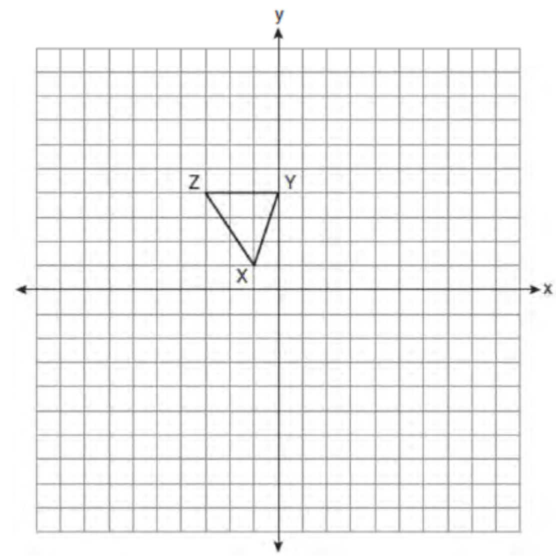
645 The coordinates of point P are $(7,1)$. What are the coordinates of the image of P after R_{90° about the origin?
1 $(1,7)$
2 $(-7,-1)$
3 $(1,-7)$
4 $(-1,7)$

646 The coordinates of the endpoints of $\overline{BC}$ are $B(5,1)$ and $C(-3,-2)$. Under the transformation R_{90}, the image of $\overline{BC}$ is $\overline{B'C'}$. State the coordinates of points B' and C'.

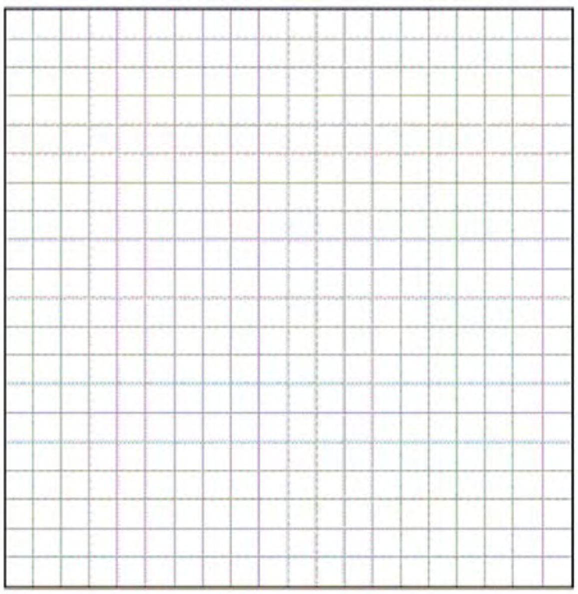
G.G.54: REFLECTIONS

647 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 $(7,-4)$

648 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 $\triangle XYZ$.



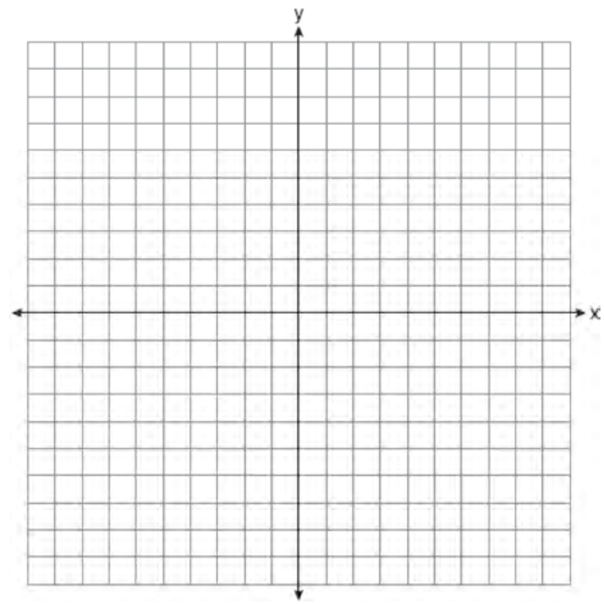
649 Triangle ABC has vertices $A(-2,2)$, $B(-1,-3)$, and $C(4,0)$. Find the coordinates of the vertices of $\triangle A'B'C'$, the image of $\triangle ABC$ after the transformation $r_{x\text{-axis}}$. [The use of the grid is optional.]



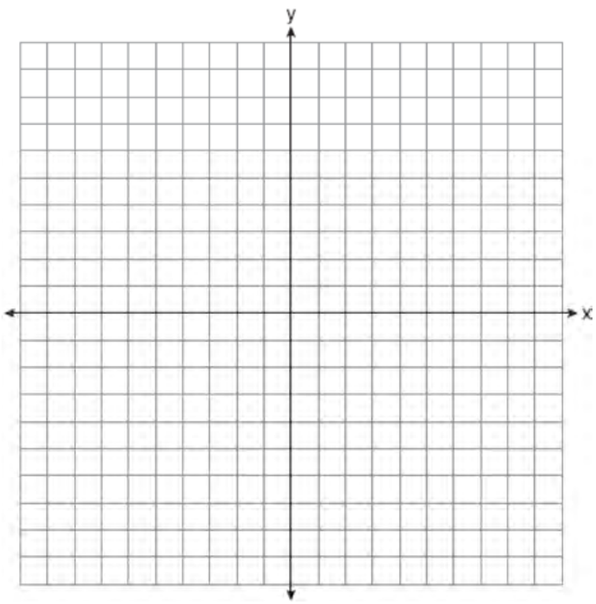
650 What is the image of the point $(2,-3)$ after the transformation $r_{y-\text{axis}}$?
1 $(2,3)$
2 $(-2,-3)$
3 $(-2,3)$
4 $(-3,2)$

651 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 $(-4b,-3a)$

652 Triangle ABC has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$. [The use of the set of axes below is optional.]



653 The image of $\overline{RS}$ after a reflection through the origin is $\overline{R'S'}$. If the coordinates of the endpoints of $\overline{RS}$ are $R(2,-3)$ and $S(5,1)$, state and label the coordinates of R' and S'. [The use of the set of axes below is optional.]



G.G.54: TRANSLATIONS

654 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 $(1,-1)$

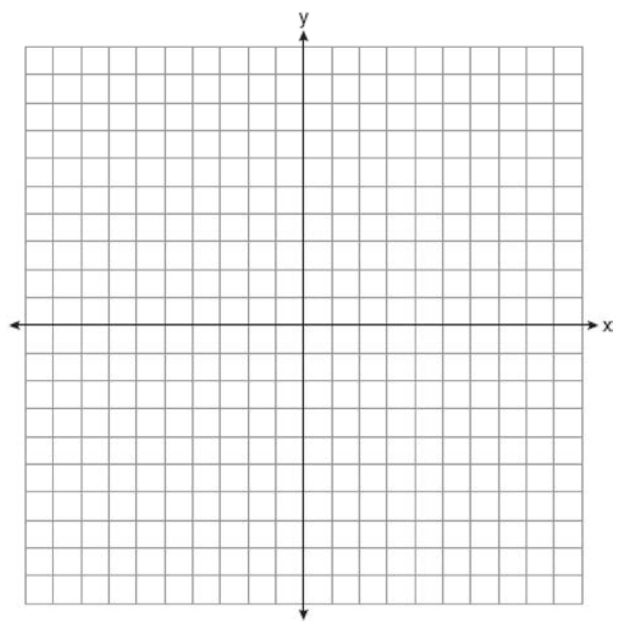
655 What is the image of the point $(-5,2)$ under the translation $T_{3,-4}$?
1 $(-9,5)$
2 $(-8,6)$
3 $(-2,-2)$
4 $(-15,-8)$

656 The image of $\triangle ABC$ under a translation is $\triangle A'B'C'$. Under this translation, $B(3,-2)$ maps onto $B'(1,-1)$. Using this translation, the coordinates of image A' are $(-2,2)$. Determine and state the coordinates of point A.

G.G.58: DILATIONS

657 Triangle ABC has vertices $A(6,6)$, $B(9,0)$, and $C(3,-3)$. State and label the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of $D_{\frac{1}{3}}$.

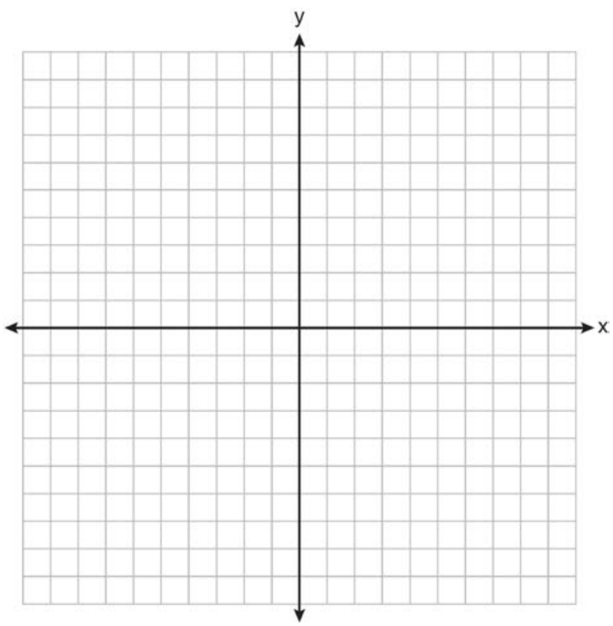
658 Triangle ABC has coordinates $A(-2,1)$, $B(3,1)$, and $C(0,-3)$. On the set of axes below, graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of 2.



659 Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation of 2. Which statement is true?
1 $AB = A'B'$
2 $BC = 2(B'C')$
3 $m\angle B = m\angle B'$
4 $m\angle A = \frac{1}{2}(m\angle A')$

G.G.54: COMPOSITIONS OF TRANSFORMATIONS

660 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.]



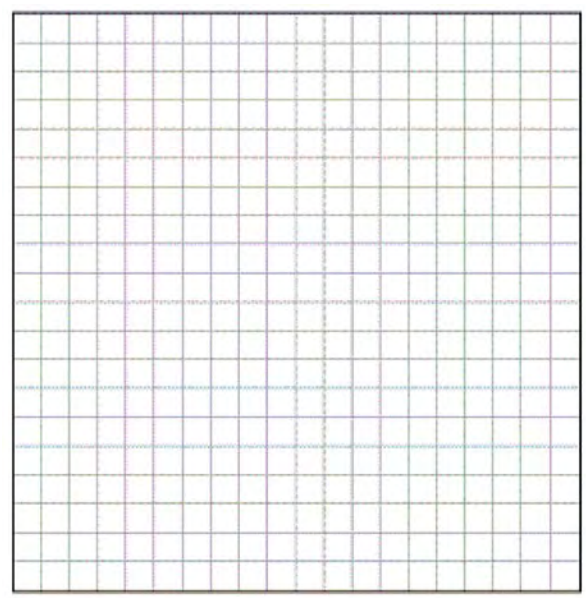
661 What is the image of point $A(4,2)$ after the composition of transformations defined by $R_{90^\circ} \circ r_{y=x}$?
1 $(-4,2)$
2 $(4,-2)$
3 $(-4,-2)$
4 $(2,-4)$

662 The point $(3,-2)$ is rotated 90º about the origin and then dilated by a scale factor of 4. What are the coordinates of the resulting image?
1 $(-12,8)$
2 (12,-8)
3 $(8,12)$
4 $(-8,-12)$

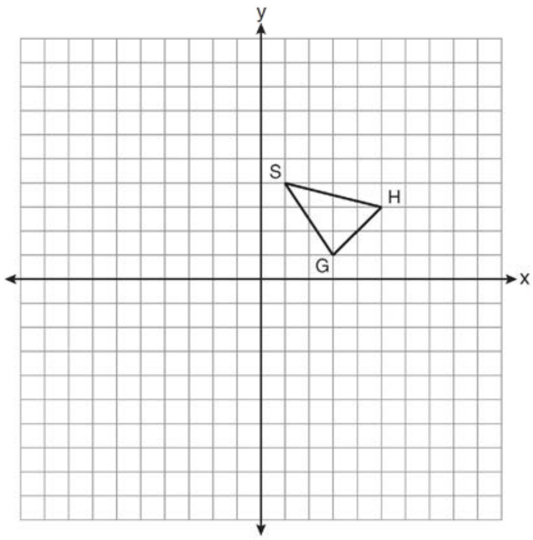
G.G.58: COMPOSITIONS OF TRANSFORMATIONS

663 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 $B''(22,-4)$

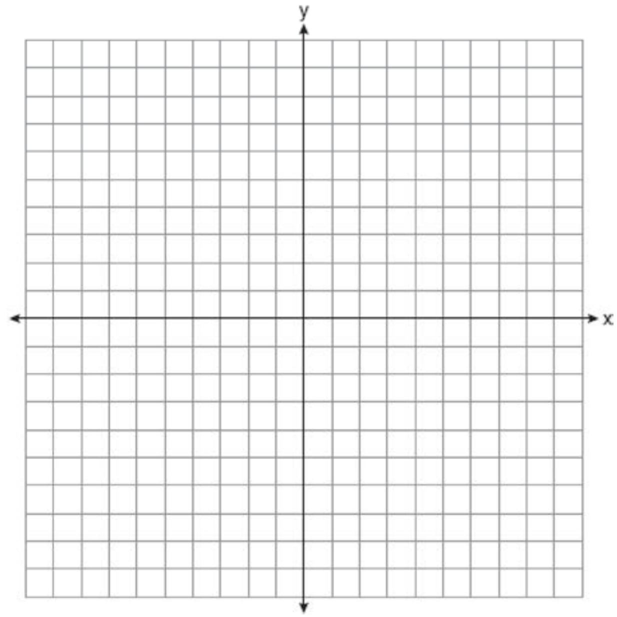
664 The coordinates of the vertices of $\triangle ABC$ $A(1,3)$, $B(-2,2)$ and $C(0,-2)$. On the grid below, graph and label $\triangle A''B''C''$, the result of the composite transformation $D_2 \circ T_{3,-2}$. State the coordinates of A'', B'', and C''.



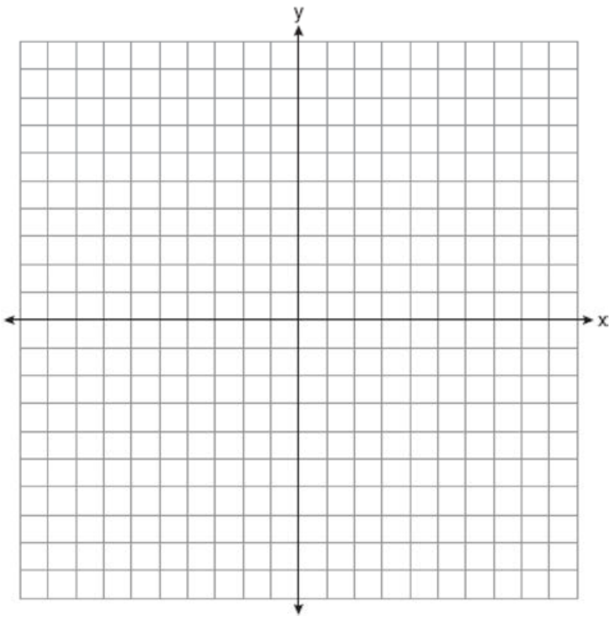
665 As shown on the set of axes below, $\triangle GHS$ has vertices $G(3,1)$, $H(5,3)$, and $S(1,4)$. Graph and state the coordinates of $\triangle G''H''S''$, the image of $\triangle GHS$ after the transformation $T_{-3,1} \circ D_2$.



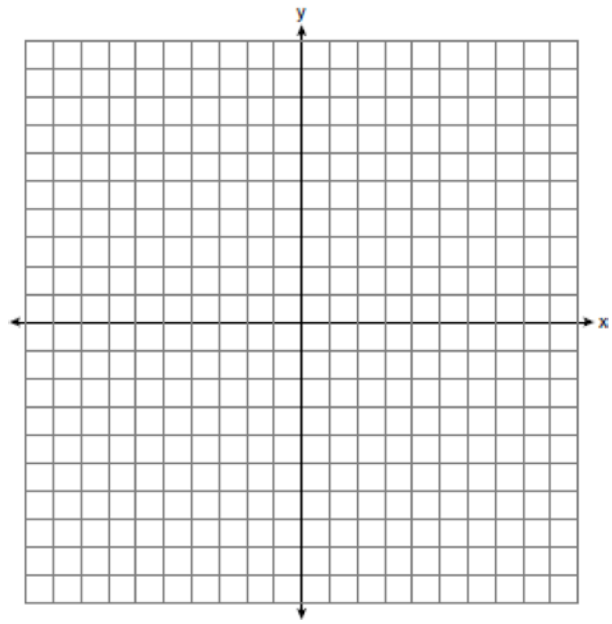
666 The coordinates of trapezoid $ABCD$ are $A(-4,5)$, $B(1,5)$, $C(1,2)$, and $D(-6,2)$. Trapezoid $A''B''C''D''$ is the image after the composition $r_{x-\text{axis}} \circ r_{y=x}$ is performed on trapezoid $ABCD$. State the coordinates of trapezoid $A''B''C''D''$. [The use of the set of axes below is optional.]



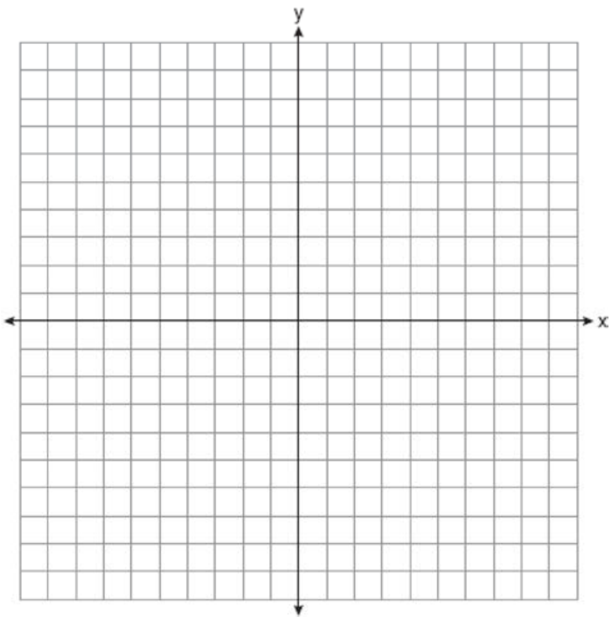
667 The vertices of $\triangle RST$ are $R(-6,5)$, $S(-7,-2)$, and $T(1,4)$. The image of $\triangle RST$ after the composition $T_{-2,3} \circ r_{y=x}$ is $\triangle R''S''T''$. State the coordinates of $\triangle R''S''T''$. [The use of the set of axes below is optional.]



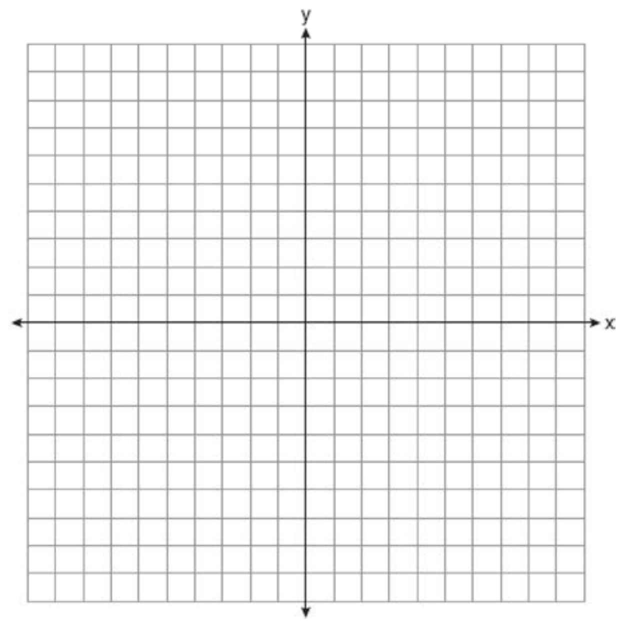
668 Triangle ABC has vertices $A(5,1)$, $B(1,4)$ and $C(1,1)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$, following the composite transformation $T_{1,-1} \circ D_2$. [The use of the set of axes below is optional.]



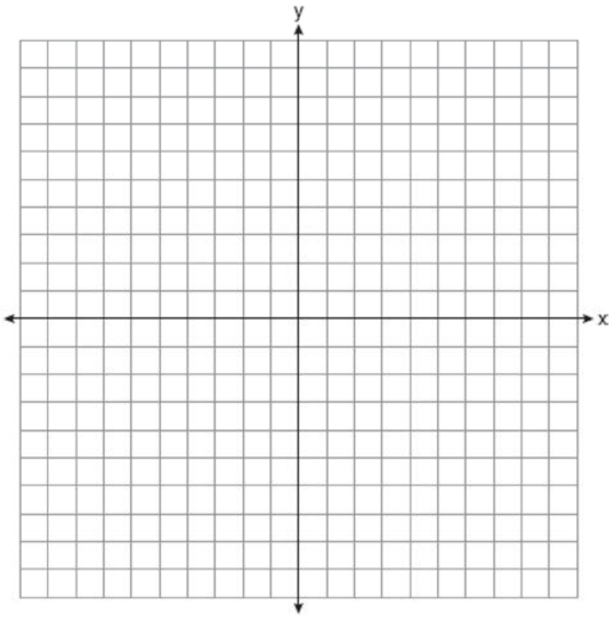
669 The coordinates of the vertices of parallelogram $SWAN$ are $S(2,-2)$, $W(-2,-4)$, $A(-4,6)$, and $N(0,8)$. State and label the coordinates of parallelogram $S''W''A''N''$, the image of $SWAN$ after the transformation $T_{4,-2} \circ D_{\frac{1}{2}}$. [The use of the set of axes below is optional.]



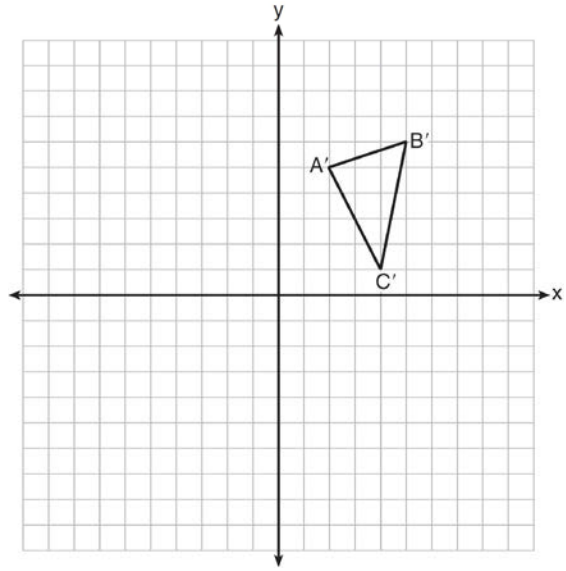
670 Quadrilateral $MATH$ has coordinates $M(-6,-3)$, $A(-1,-3)$, $T(-2,-1)$, and $H(-4,-1)$. The image of quadrilateral $MATH$ after the composition $r_{x\text{-axis}} \circ T_{7,5}$ is quadrilateral $M''A''T''H''$. State and label the coordinates of $M''A''T''H''$. [The use of the set of axes below is optional.]



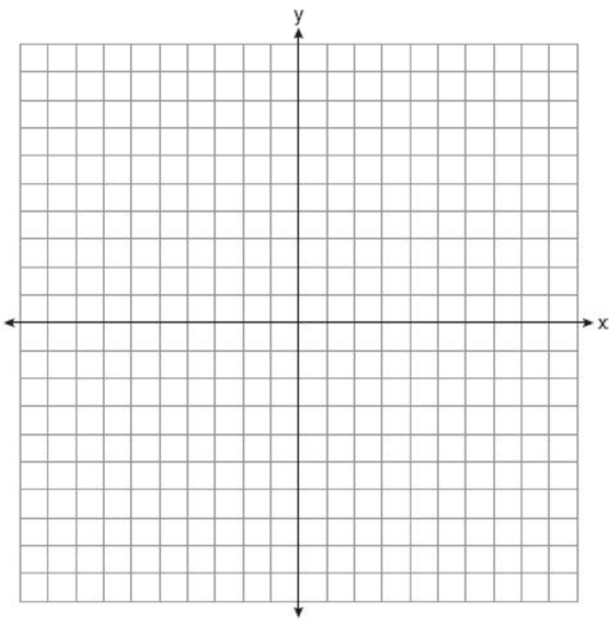
671 The coordinates of the vertices of $\triangle ABC$ are $A(-6,5)$, $B(-4,8)$, and $C(1,6)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$ after the composition of transformations $T_{(4,-5)} \circ r_{y\text{-axis}}$. [The use of the set of axes below is optional.]



672 The graph below shows $\triangle A'B'C'$, the image of $\triangle ABC$ after it was reflected over the y-axis. Graph and label $\triangle ABC$, the pre-image of $\triangle A'B'C'$. Graph and label $\triangle A''B''C''$, the image of $\triangle A'B'C'$ after it is reflected through the origin. State a single transformation that will map $\triangle ABC$ onto $\triangle A''B''C''$.

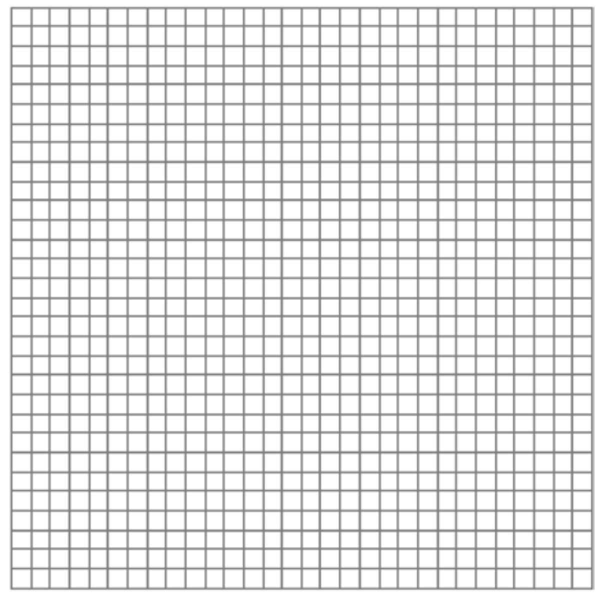


673 Quadrilateral *HYPE* has vertices $H(2,3)$, $Y(1,7)$, $P(-2,7)$, and $E(-2,4)$. State and label the coordinates of the vertices of $H''Y''P''E''$ after the composition of transformations $r_{x-axis} \circ T_{5,-3}$. [The use of the set of axes below is optional.]

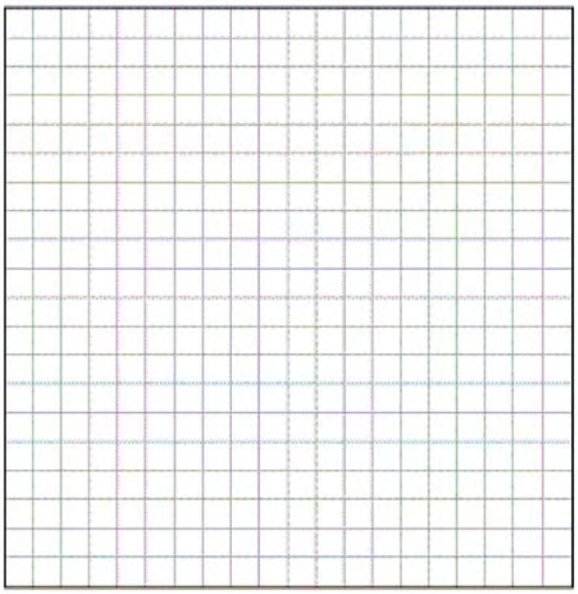


G.G.55: PROPERTIES OF TRANSFORMATIONS

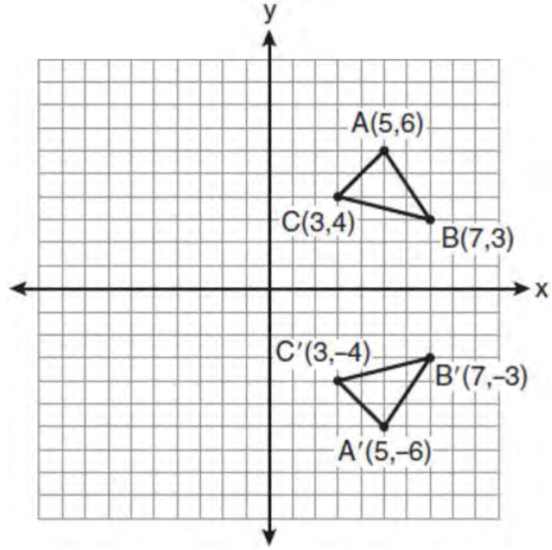
674 The vertices of $\triangle ABC$ are $A(3,2)$, $B(6,1)$, and $C(4,6)$. Identify and graph a transformation of $\triangle ABC$ such that its image, $\triangle A'B'C'$, results in $\overline{AB} \parallel \overline{A'B'}$.



675 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.

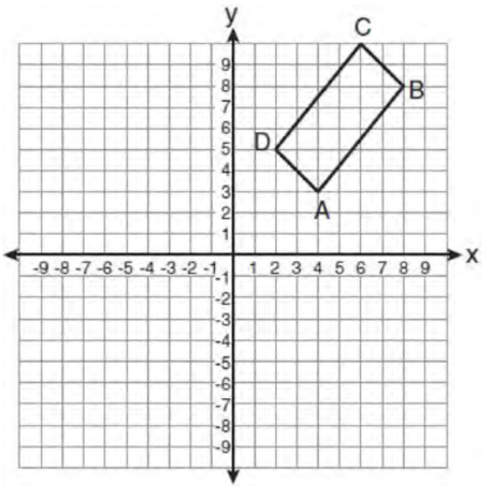


676 Which expression best describes the transformation shown in the diagram below?



1 same orientation; reflection
2 opposite orientation; reflection
3 same orientation; translation
4 opposite orientation; translation

677 The rectangle $ABCD$ shown in the diagram below will be reflected across the x-axis.



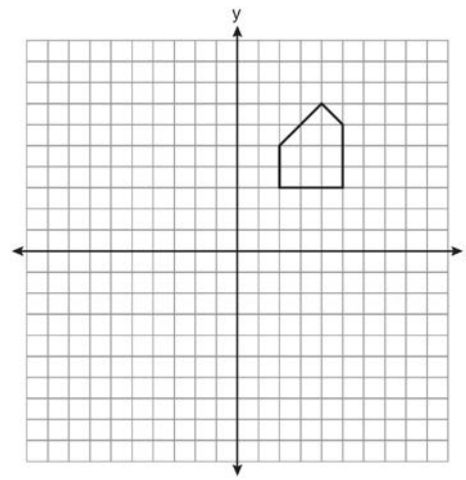
What will *not* be preserved?

1 slope of $\overline{AB}$
2 parallelism of $\overline{AB}$ and $\overline{CD}$
3 length of $\overline{AB}$
4 measure of $\angle A$

678 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 $\overline{N'O'}$

679 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.]



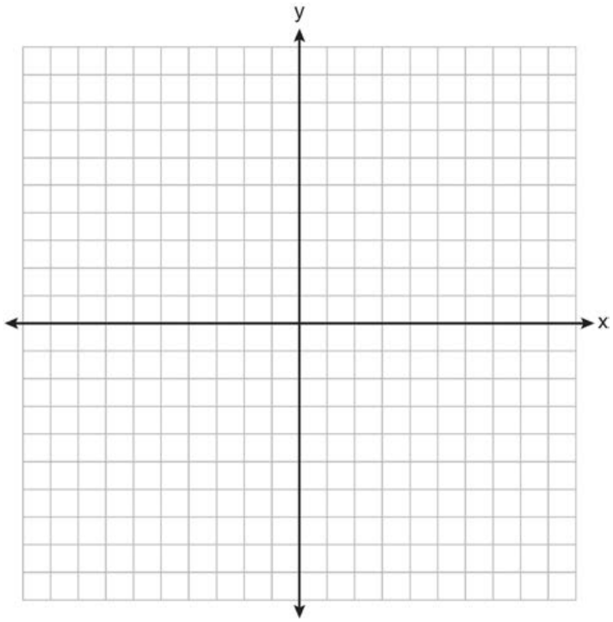
680 Pentagon $PQRST$ has $\overline{PQ}$ parallel to $\overline{TS}$. After a translation of $T_{2,-5}$, which line segment is parallel to $\overline{P'Q'}$?

1 $\overline{R'Q'}$
2 $\overline{R'S'}$
3 $\overline{T'S'}$
4 $\overline{T'P'}$

681 When a quadrilateral is reflected over the line $y = x$, which geometric relationship is *not* preserved?

1 congruence
2 orientation
3 parallelism
4 perpendicularity

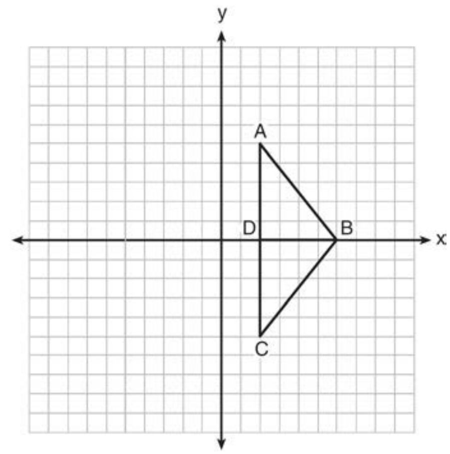
682 Triangle ABC has coordinates $A(2,-2)$, $B(2,1)$, and $C(4,-2)$. Triangle $A'B'C'$ is the image of $\triangle ABC$ under $T_{5,-2}$. On the set of axes below, graph and label $\triangle ABC$ and its image, $\triangle A'B'C'$. Determine the relationship between the area of $\triangle ABC$ and the area of $\triangle A'B'C'$. Justify your response.



683 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

684 After the transformation $r_{y=x}$, the image of $\triangle ABC$ is $\triangle A'B'C'$. If $AB = 2x + 13$ and $A'B' = 9x - 8$, find the value of x.

685 As shown in the diagram below, when right triangle DAB is reflected over the x-axis, its image is triangle DCB.

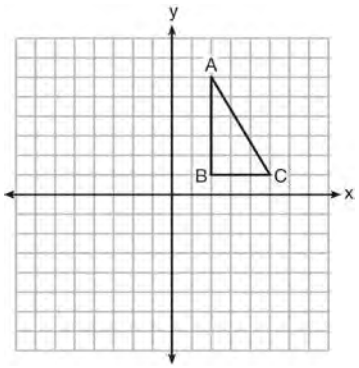


Which statement justifies why $\overline{AB} \cong \overline{CB}$?
1 Distance is preserved under reflection.
2 Orientation is preserved under reflection.
3 Points on the line of reflection remain invariant.
4 Right angles remain congruent under reflection.

686 Triangle ABC has the coordinates $A(1,2)$, $B(5,2)$, and $C(5,5)$. Triangle ABC is rotated 180° about the origin to form triangle $A'B'C'$. Triangle $A'B'C'$ is
1 acute
2 isosceles
3 obtuse
4 right

687 The image of rhombus $VWXY$ preserves which properties under the transformation $T_{2,-3}$?
1 parallelism, only
2 orientation, only
3 both parallelism and orientation
4 neither parallelism nor orientation

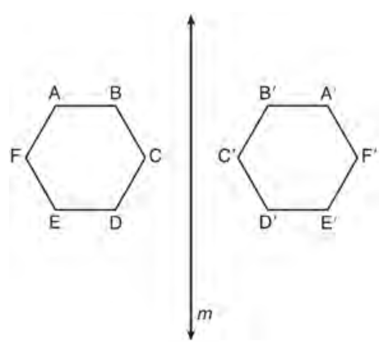
688 Right triangle ABC is shown in the graph below.



After a reflection over the y-axis, the image of $\triangle ABC$ is $\triangle A'B'C'$. Which statement is *not* true?

1 $\overline{BC} \cong \overline{B'C'}$
2 $\overline{A'B'} \perp \overline{B'C'}$
3 $AB = A'B'$
4 $\overline{AC} \parallel \overline{A'C'}$

689 As shown in the diagram below, when hexagon $ABCDEF$ is reflected over line m, the image is hexagon $A'B'C'D'E'F'$.



Under this transformation, which property is *not* preserved?

1 area
2 distance
3 orientation
4 angle measure

690 If $\triangle W'X'Y'$ is the image of $\triangle WXY$ after the transformation R_{90°, which statement is *false*?

1 $XY = X'Y'$
2 $\overline{WX} \parallel \overline{W'X'}$
3 $\triangle WXY \cong \triangle W'X'Y'$
4 $m\angle XWY = m\angle X'W'Y'$

691 The image of $\triangle ABC$ after the transformation $r_{y-\text{axis}}$ is $\triangle A'B'C'$. Which property is *not* preserved?

1 distance
2 orientation
3 collinearity
4 angle measure

G.G.57: PROPERTIES OF TRANSFORMATIONS

692 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 $r_{x=1}$

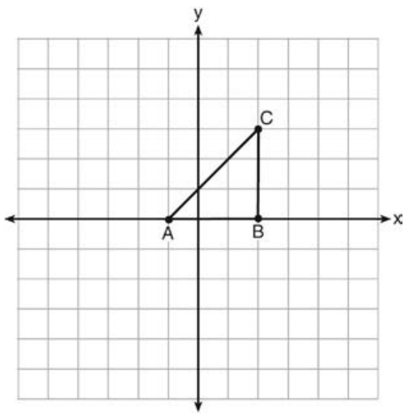
G.G.59: PROPERTIES OF TRANSFORMATIONS

693 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.

694 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 $\triangle A'B'C'$

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

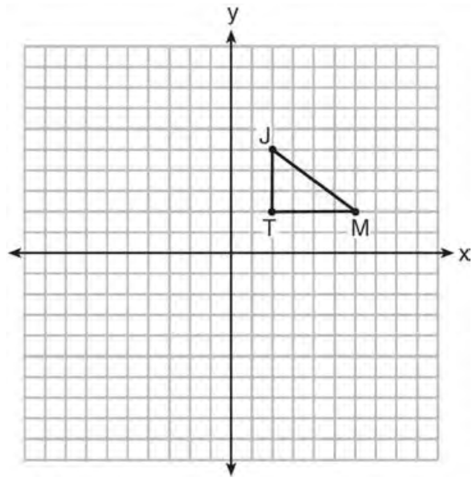


Which transformation produces an image that is similar to, but *not* congruent to, $\triangle ABC$?
1 $T_{2,3}$
2 D_2
3 $r_{y=x}$
4 R_{90}

696 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

697 If $\triangle ABC$ and its image, $\triangle A'B'C'$, are graphed on a set of axes, $\triangle ABC \cong \triangle A'B'C'$ under each transformation *except*
1 D_2
2 R_{90°
3 $r_{y=x}$
4 $T_{(-2,3)}$

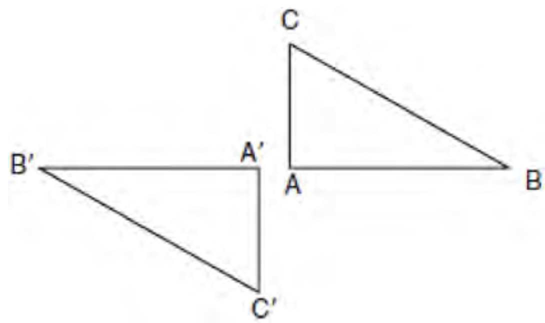
698 Triangle JTM is shown on the graph below.



Which transformation would result in an image that is *not* congruent to $\triangle JTM$?
1 $r_{y=x}$
2 R_{90°
3 $T_{0,-3}$
4 D_2

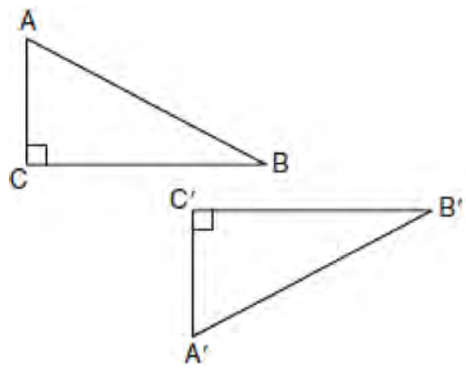
G.G.56: IDENTIFYING TRANSFORMATIONS

699 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

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

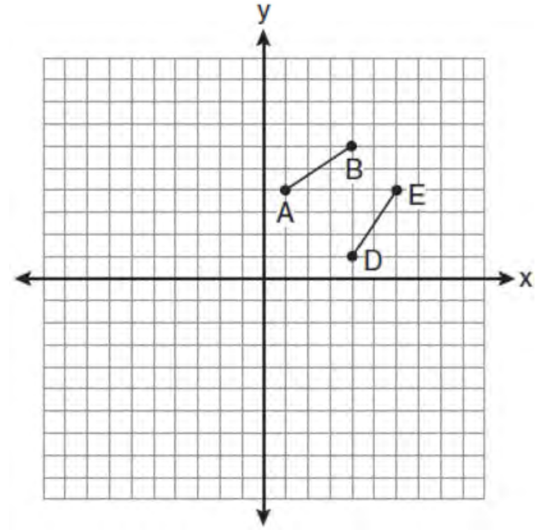


1 dilation
2 rotation
3 reflection
4 glide reflection

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

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

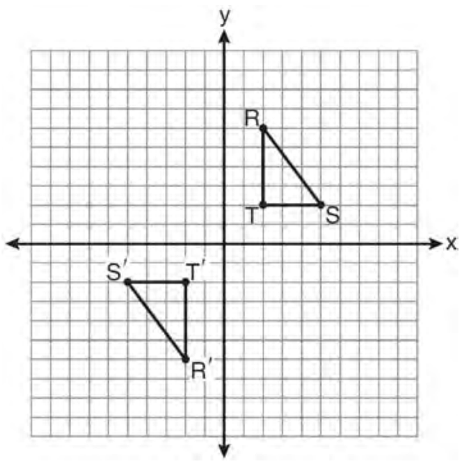
703 The diagram below shows $\overline{AB}$ and $\overline{DE}$.



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 $r_{y=x}$

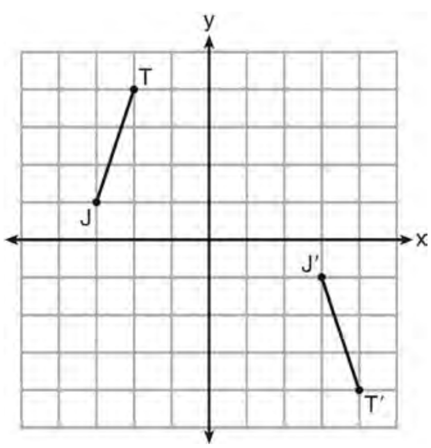
704 A transformation of a polygon that always preserves both length and orientation is
1 dilation
2 translation
3 line reflection
4 glide reflection

705 As shown on the graph below, $\triangle R'S'T'$ is the image of $\triangle RST$ under a single transformation.



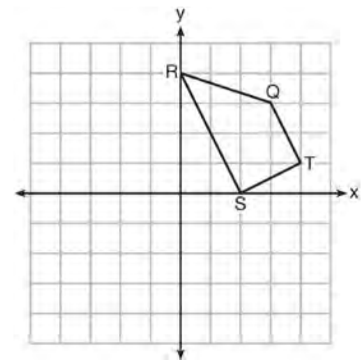
Which transformation does this graph represent?
1 glide reflection
2 line reflection
3 rotation
4 translation

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



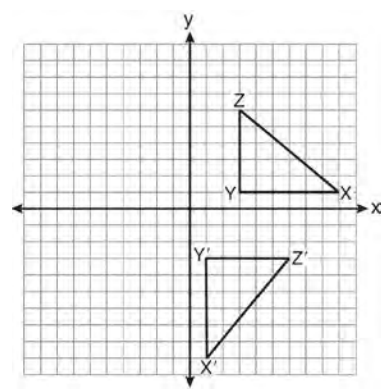
Which transformation would map $\overline{JT}$ onto $\overline{J'T'}$?
1 translation
2 glide reflection
3 rotation centered at the origin
4 reflection through the origin

707 Trapezoid *QRST* is graphed on the set of axes below.



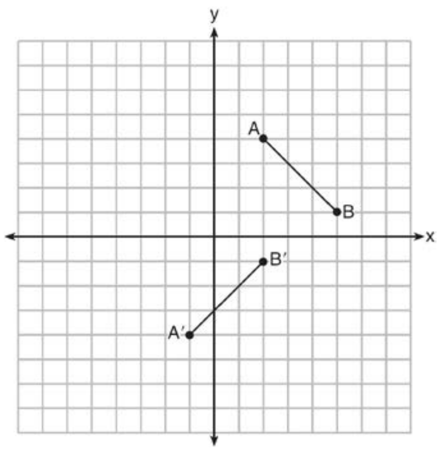
Under which transformation will there be *no* invariant points?
1 $r_{y=0}$
2 $r_{x=0}$
3 $r_{(0,0)}$
4 $r_{y=x}$

708 In the diagram below, under which transformation is $\triangle X'Y'Z'$ the image of $\triangle XYZ$?



1 dilation
2 reflection
3 rotation
4 translation

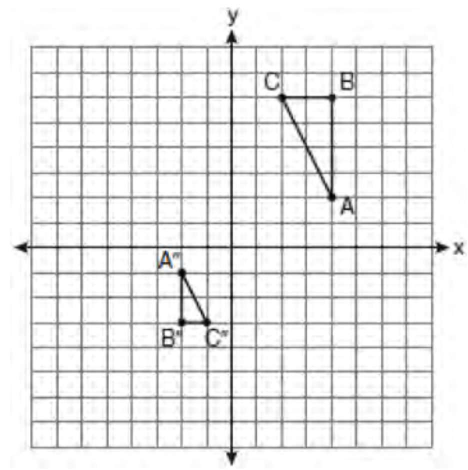
709 In the diagram below, $\overline{A'B'}$ is the image of $\overline{AB}$ under which single transformation?



1 dilation
2 rotation
3 translation
4 glide reflection

G.G.60: IDENTIFYING TRANSFORMATIONS

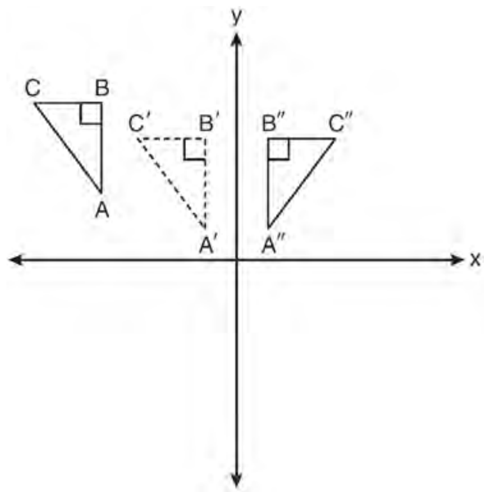
710 After a composition of transformations, the coordinates $A(4,2)$, $B(4,6)$, and $C(2,6)$ become $A''(-2,-1)$, $B''(-2,-3)$, and $C''(-1,-3)$, as shown on the set of axes below.



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

711 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 $r_{y=x}$

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

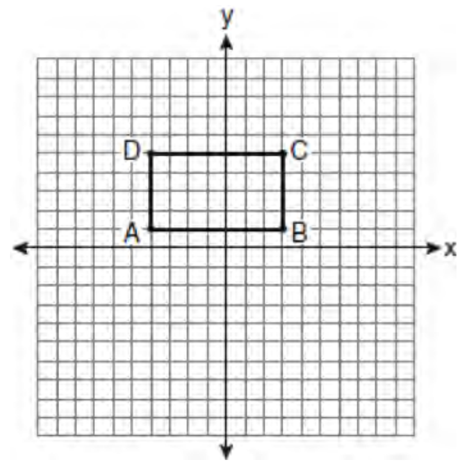


The composite transformation of $\triangle ABC$ to $\triangle A''B''C''$ is an example of a
1 reflection followed by a rotation
2 reflection followed by a translation
3 translation followed by a rotation
4 translation followed by a reflection

G.G.61: ANALYTICAL REPRESENTATIONS OF TRANSFORMATIONS

713 A polygon is transformed according to the rule: $(x,y) \to (x+2,y)$. Every point of the polygon moves two units in which direction?
1 up
2 down
3 left
4 right

714 On the set of axes below, Geoff drew rectangle *ABCD*. He will transform the rectangle by using the translation $(x,y) \to (x+2,y+1)$ and then will reflect the translated rectangle over the *x*-axis.



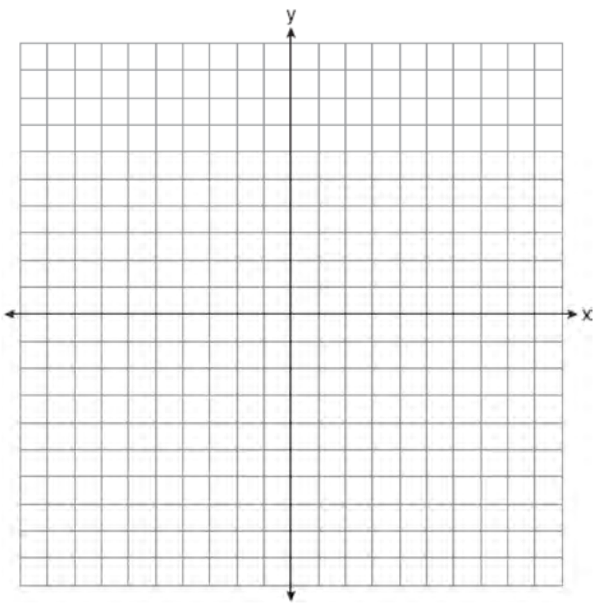
What will be the area of the rectangle after these transformations?
1 exactly 28 square units
2 less than 28 square units
3 greater than 28 square units
4 It cannot be determined from the information given.

715 Quadrilateral *ABCD* undergoes a transformation, producing quadrilateral $A'B'C'D'$. For which transformation would the area of $A'B'C'D'$ *not* be equal to the area of *ABCD*?
1 a rotation of 90° about the origin
2 a reflection over the *y*-axis
3 a dilation by a scale factor of 2
4 a translation defined by $(x,y) \to (x+4,y-1)$

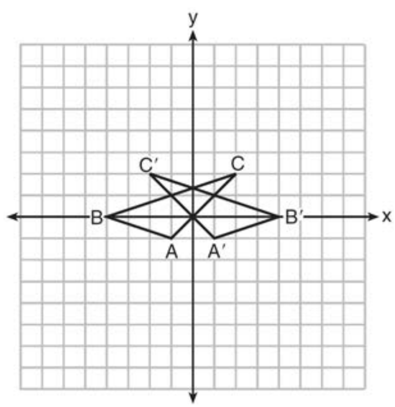
716 What are the coordinates of the image of point $A(2,-7)$ under the translation $(x,y) \to (x-3,y+5)$?
1 $(-1,-2)$
2 $(-1,2)$
3 $(5,-12)$
4 $(5,12)$

Geometry Regents Exam Questions by Performance Indicator: Topic

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



718 In the diagram below, under which transformation is $\triangle A'B'C'$ the image of $\triangle ABC$?



1 D_2
2 $r_{x\text{-axis}}$
3 $r_{y\text{-axis}}$
4 $(x,y) \rightarrow (x-2,y)$

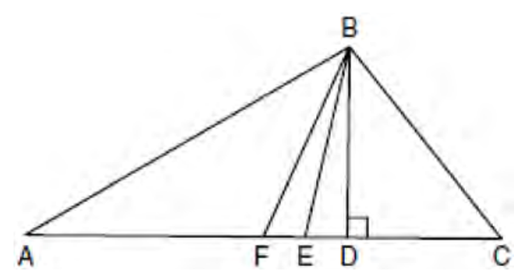
719 What are the coordinates of P', the image of point $P(x,y)$ after translation $T_{4,4}$?
1 $(x-4,y-4)$
2 $(x+4,y+4)$
3 $(4x,4y)$
4 $(4,4)$

LOGIC

G.G.24: STATEMENTS AND NEGATIONS

720 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.

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

722 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.

723 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.

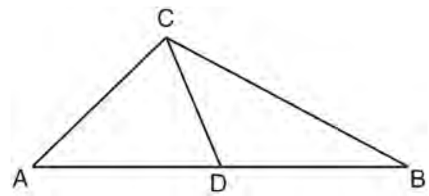
724 Given the true statement, "The medians of a triangle are concurrent," write the negation of the statement and give the truth value for the negation.

725 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

726 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

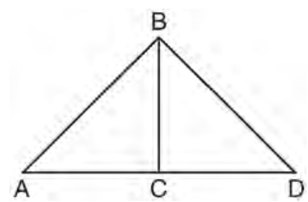
727 Write the negation of the statement “2 is a prime number,” and determine the truth value of the negation.

728 As shown in the diagram below, $\overline{CD}$ is a median of $\triangle ABC$.



Which statement is *always* true?
1 $\overline{AD} \cong \overline{DB}$
2 $\overline{AC} \cong \overline{AD}$
3 $\angle ACD \cong \angle CDB$
4 $\angle BCD \cong \angle ACD$

729 Given: $\triangle ABD$, $\overline{BC}$ is the perpendicular bisector of $\overline{AD}$

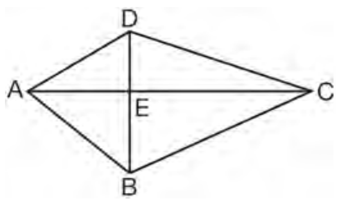


Which statement can *not* always be proven?
1 $\overline{AC} \cong \overline{DC}$
2 $\overline{BC} \cong \overline{CD}$
3 $\angle ACB \cong \angle DCB$
4 $\triangle ABC \cong \triangle DBC$

730 Given the statement: One is a prime number. What is the negation and the truth value of the negation?
1 One is not a prime number; true
2 One is not a prime number; false
3 One is a composite number; true
4 One is a composite number; false

731 What are the truth values of the statement "Two is prime" and its negation?
1 The statement is false and its negation is true.
2 The statement is false and its negation is false.
3 The statement is true and its negation is true.
4 The statement is true and its negation is false.

732 In the diagram below of quadrilateral $ABCD$, diagonals $\overline{AEC}$ and $\overline{BED}$ are perpendicular at E.



Which statement is always true based on the given information?
1 $\overline{DE} \cong \overline{EB}$
2 $\overline{AD} \cong \overline{AB}$
3 $\angle DAC \cong \angle BAC$
4 $\angle AED \cong \angle CED$

733 What are the truth values of the statement "Opposite angles of a trapezoid are always congruent" and its negation?
1 The statement is true and its negation is true.
2 The statement is true and its negation is false.
3 The statement is false and its negation is true.
4 The statement is false and its negation is false.

G.G.25: COMPOUND STATEMENTS

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

735 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.

736 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

737 Which statement has the same truth value as the statement "If a quadrilateral is a square, then it is a rectangle"?
1 If a quadrilateral is a rectangle, then it is a square.
2 If a quadrilateral is a rectangle, then it is not a square.
3 If a quadrilateral is not a square, then it is not a rectangle.
4 If a quadrilateral is not a rectangle, then it is not a square.

738 Which compound statement is true?
1 A square has four sides or a hexagon has eight sides.
2 A square has four sides and a hexagon has eight sides.
3 If a square has four sides, then a hexagon has eight sides.
4 A square has four sides if and only if a hexagon has eight sides.

739 The statement "$x > 5$ or $x < 3$" is *false* when x is equal to
1 1
2 2
3 7
4 4

G.G.26: CONDITIONAL STATEMENTS

740 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.

741 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.

742 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.

743 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.

744 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.

745 Consider the relationship between the two statements below.

$$\text{If } \sqrt{16+9} \neq 4+3, \text{ then } 5 \neq 4+3$$

$$\text{If } \sqrt{16+9} = 4+3, \text{ then } 5 = 4+3$$

These statements are
1 inverses
2 converses
3 contrapositives
4 biconditionals

746 What is the converse of “If an angle measures 90 degrees, then it is a right angle”?
1 If an angle is a right angle, then it measures 90 degrees.
2 An angle is a right angle if it measures 90 degrees.
3 If an angle is not a right angle, then it does not measure 90 degrees.
4 If an angle does not measure 90 degrees, then it is not a right angle.

747 Lines m and n are in plane $\mathcal{A}$. What is the converse of the statement "If lines m and n are parallel, then lines m and n do not intersect"?

1 If lines m and n are not parallel, then lines m and n intersect.
2 If lines m and n are not parallel, then lines m and n do not intersect
3 If lines m and n intersect, then lines m and n are not parallel.
4 If lines m and n do not intersect, then lines m and n are parallel.

748 Given the statement, "If a number has exactly two factors, it is a prime number," what is the contrapositive of this statement?

1 If a number does not have exactly two factors, then it is not a prime number.
2 If a number is not a prime number, then it does not have exactly two factors.
3 If a number is a prime number, then it has exactly two factors.
4 A number is a prime number if it has exactly two factors.

749 Which statement is the inverse of "If $x+3=7$, then $x=4$"?

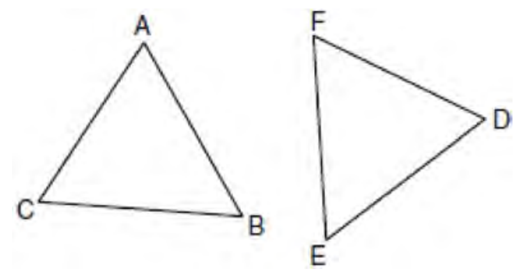
1 If $x=4$, then $x+3=7$.
2 If $x \neq 4$, then $x+3 \neq 7$.
3 If $x+3 \neq 7$, then $x \neq 4$.
4 If $x+3=7$, then $x \neq 4$.

750 Given: "If a polygon is a triangle, then the sum of its interior angles is 180°." What is the contrapositive of this statement?

1 "If the sum of the interior angles of a polygon is not 180°, then it is not a triangle."
2 "A polygon is a triangle if and only if the sum of its interior angles is 180°."
3 "If a polygon is not a triangle, then the sum of the interior angles is not 180°."
4 "If the sum of the interior angles of a polygon is 180°, then it is a triangle."

G.G.28: TRIANGLE CONGRUENCY

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



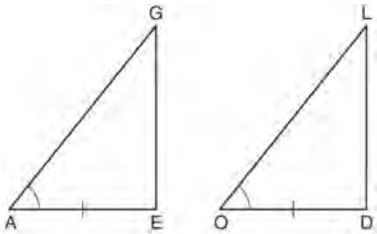
Which method can be used to prove $\triangle ABC \cong \triangle DEF$?

1 SSS
2 SAS
3 ASA
4 HL

752 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

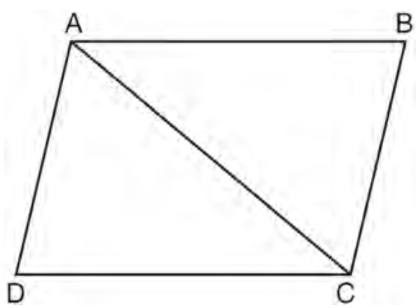
753 In the diagram below of $\triangle AGE$ and $\triangle OLD$, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.



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 $\angle AEG \cong \angle ODL$

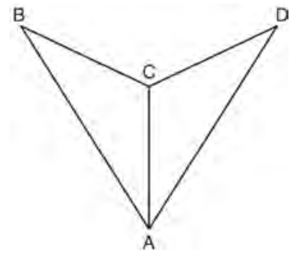
754 In the diagram of quadrilateral $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\angle ABC \cong \angle CDA$, and diagonal $\overline{AC}$ is drawn.



Which method can be used to prove $\triangle ABC$ is congruent to $\triangle CDA$?

1 AAS
2 SSA
3 SAS
4 SSS

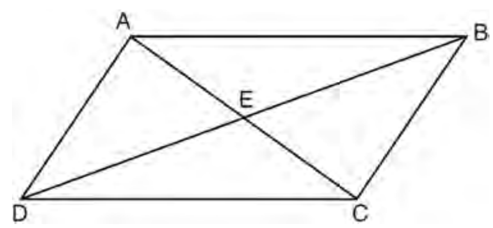
755 As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.



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

1 SSS
2 AAA
3 SAS
4 AAS

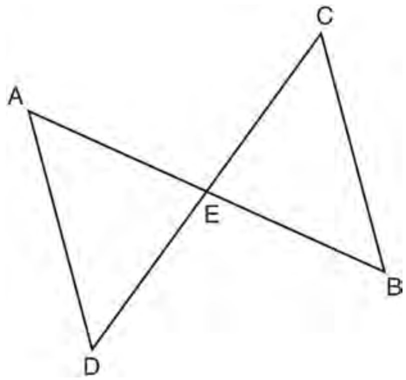
756 In parallelogram $ABCD$ shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



Which statement must be true?

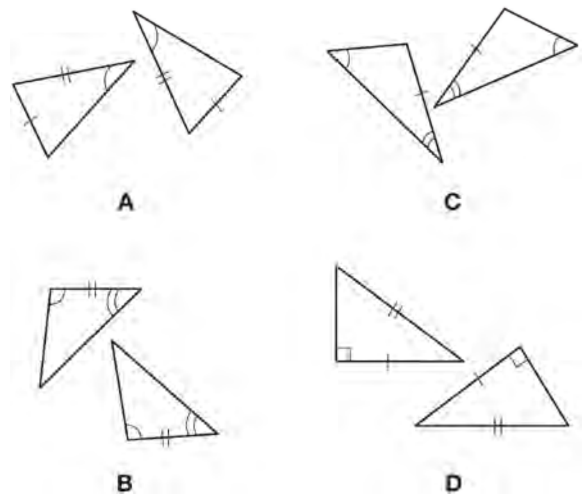
1 $\overline{AC} \cong \overline{DB}$
2 $\angle ABD \cong \angle CBD$
3 $\triangle AED \cong \triangle CEB$
4 $\triangle DCE \cong \triangle BCE$

757 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

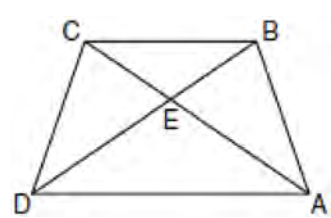
758 In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair.



Using only the information given in the diagrams, which pair of triangles can *not* be proven congruent?
1 *A*
2 *B*
3 *C*
4 *D*

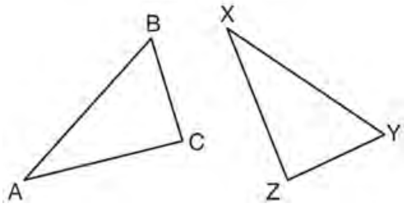
G.G.29: TRIANGLE CONGRUENCY

759 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 $\angle CDB \cong \angle BAC$

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



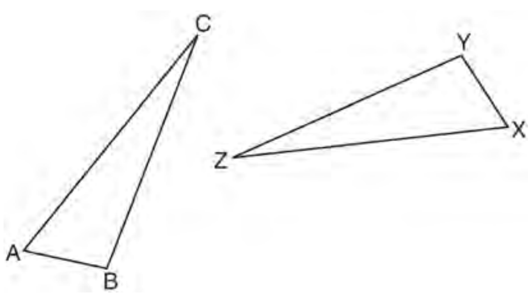
Which two statements identify corresponding congruent parts for these triangles?

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 $\angle A \cong \angle X$

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

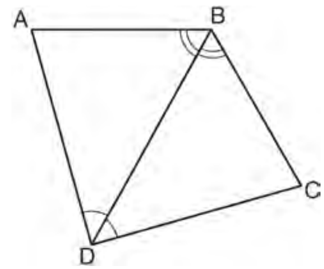
762 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which statement must be true?

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

763 The diagram below shows a pair of congruent triangles, with $\angle ADB \cong \angle CDB$ and $\angle ABD \cong \angle CBD$.



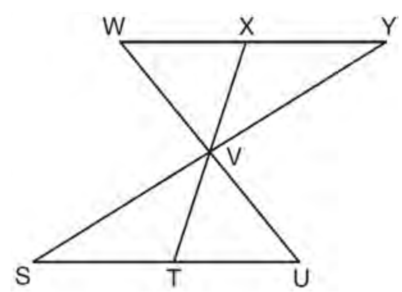
Which statement must be true?

1 $\angle ADB \cong \angle CBD$
2 $\angle ABC \cong \angle ADC$
3 $\overline{AB} \cong \overline{CD}$
4 $\overline{AD} \cong \overline{CD}$

764 If $\triangle MNP \cong \triangle VWX$ and $\overline{PM}$ is the shortest side of $\triangle MNP$, what is the shortest side of $\triangle VWX$?

1 $\overline{XV}$
2 $\overline{WX}$
3 $\overline{VW}$
4 $\overline{NP}$

765 In the diagram below, $\triangle XYV \cong \triangle TSV$.

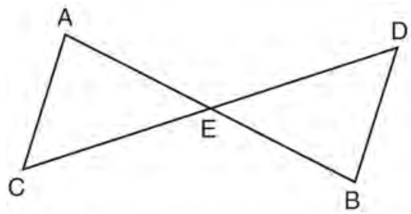


Which statement can *not* be proven?

1 $\angle XVY \cong \angle TVS$
2 $\angle VYX \cong \angle VUT$
3 $\overline{XY} \cong \overline{TS}$
4 $\overline{YV} \cong \overline{SV}$

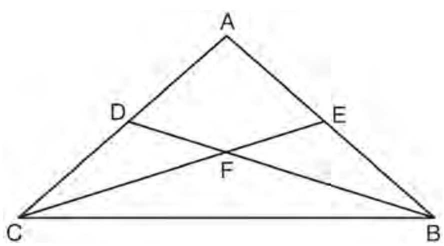
766 If $\triangle ABC \cong \triangle JKL \cong \triangle RST$, then $\overline{BC}$ must be congruent to
1 $\overline{JL}$
2 $\overline{JK}$
3 $\overline{ST}$
4 $\overline{RS}$

767 In the diagram below, $\triangle AEC \cong \triangle BED$.



Which statement is *not* always true?
1 $\overline{AC} \cong \overline{BD}$
2 $\overline{CE} \cong \overline{DE}$
3 $\angle EAC \cong \angle EBD$
4 $\angle ACE \cong \angle DBE$

768 In $\triangle ABC$ shown below with $\overline{ADC}$, $\overline{AEB}$, $\overline{CFE}$, and $\overline{BFD}$, $\triangle ACE \cong \triangle ABD$.



Which statement must be true?
1 $\angle ACF \cong \angle BCF$
2 $\angle DAE \cong \angle DFE$
3 $\angle BCD \cong \angle ABD$
4 $\angle AEF \cong \angle ADF$

G.G.27: LINE PROOFS

769 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 $AB + CD = AD$

770 In the diagram of $\overline{WXYZ}$ below, $\overline{WY} \cong \overline{XZ}$.

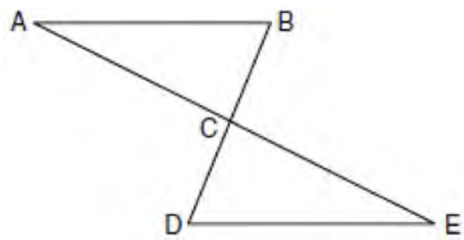
Which reasons can be used to prove $\overline{WX} \cong \overline{YZ}$?
1 reflexive property and addition postulate
2 reflexive property and subtraction postulate
3 transitive property and addition postulate
4 transitive property and subtraction postulate

G.G.27: ANGLE PROOFS

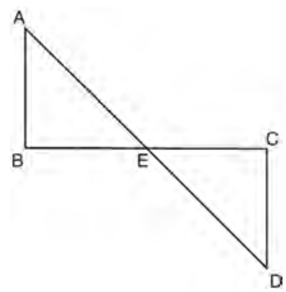
771 When writing a geometric proof, which angle relationship could be used alone to justify that two angles are congruent?
1 supplementary angles
2 linear pair of angles
3 adjacent angles
4 vertical angles

G.G.27: TRIANGLE PROOFS

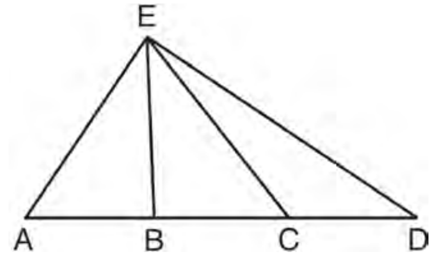
772 Given: $\triangle ABC$ and $\triangle EDC$, C is the midpoint of $\overline{BD}$ and $\overline{AE}$
Prove: $\overline{AB} \parallel \overline{DE}$



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



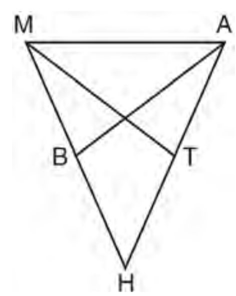
774 In $\triangle AED$ with $\overline{ABCD}$ shown in the diagram below, $\overline{EB}$ and $\overline{EC}$ are drawn.



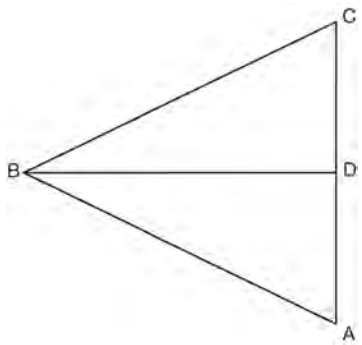
If $\overline{AB} \cong \overline{CD}$, which statement could always be proven?

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

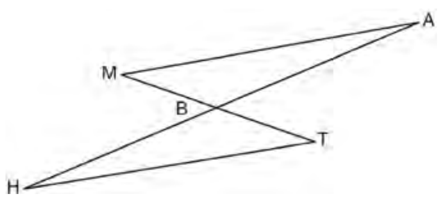
775 In the diagram of $\triangle MAH$ below, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are drawn.
Prove: $\angle MBA \cong \angle ATM$



776 Given: $\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$
Prove: $\overline{AB} \cong \overline{CB}$

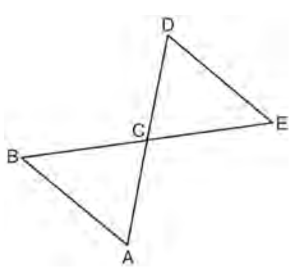


777 Given: $\overline{MT}$ and $\overline{HA}$ intersect at B, $\overline{MA} \parallel \overline{HT}$, and $\overline{MT}$ bisects $\overline{HA}$.



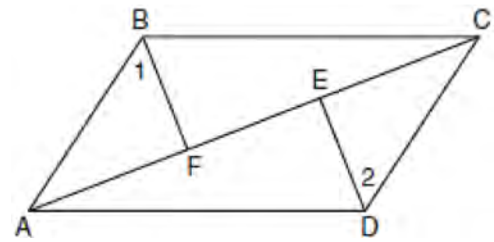
Prove: $\overline{MA} \cong \overline{HT}$

778 Given: $\overline{BE}$ and $\overline{AD}$ intersect at point C
$\overline{BC} \cong \overline{EC}$
$\overline{AC} \cong \overline{DC}$
$\overline{AB}$ and $\overline{DE}$ are drawn
Prove: $\triangle ABC \cong \triangle DEC$

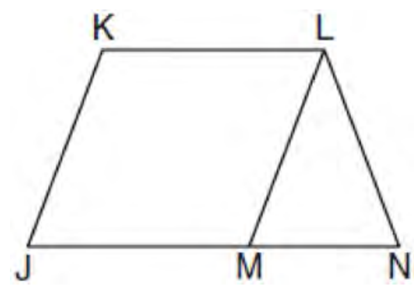


G.G.27: QUADRILATERAL PROOFS

779 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.

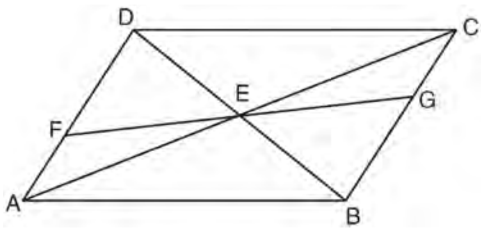


780 Given: $JKLM$ is a parallelogram.
$\overline{JM} \cong \overline{LN}$
$\angle LMN \cong \angle LNM$
Prove: $JKLM$ is a rhombus.

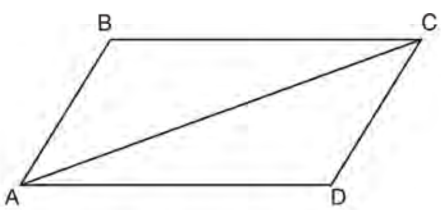


781 Given: Quadrilateral $ABCD$ with $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{BC}$, and diagonal $\overline{BD}$ is drawn
Prove: $\angle BDC \cong \angle ABD$

782 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: $\triangle AEF \cong \triangle CEG$



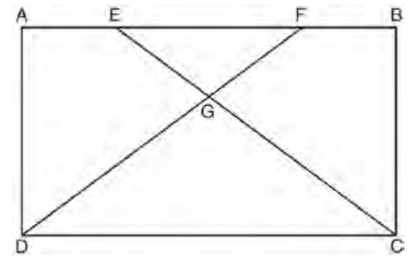
783 Given that $ABCD$ is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.



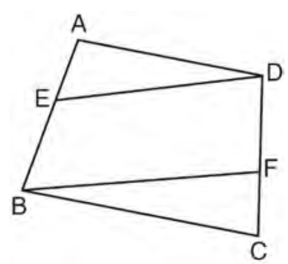
Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$ $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side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

784 The diagram below shows rectangle $ABCD$ with points E and F on side $\overline{AB}$. Segments CE and DF intersect at G, and $\angle ADG \cong \angle BCG$. Prove: $\overline{AE} \cong \overline{BF}$

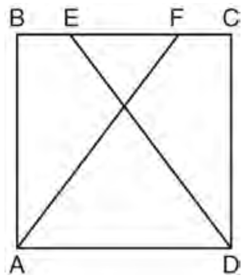


785 In the diagram below of quadrilateral $ABCD$, E and F are points on $\overline{AB}$ and $\overline{CD}$, respectively, $\overline{BE} \cong \overline{DF}$, and $\overline{AE} \cong \overline{CF}$.

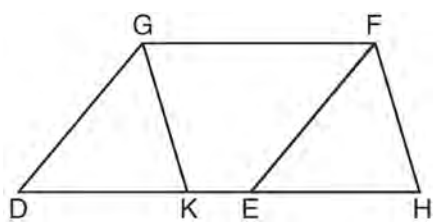


Which conclusion can be proven?
1 $\overline{ED} \cong \overline{FB}$
2 $\overline{AB} \cong \overline{CD}$
3 $\angle A \cong \angle C$
4 $\angle AED \cong \angle CFB$

786 The diagram below shows square $ABCD$ where E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments AF and DE are drawn. Prove that $\overline{AF} \cong \overline{DE}$.



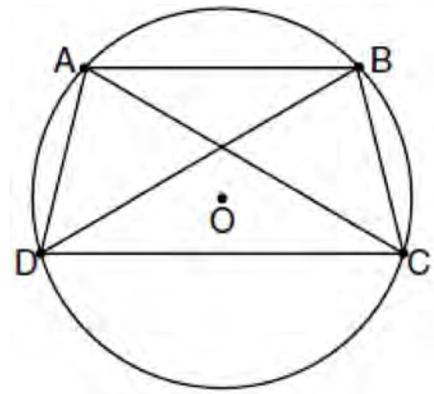
787 Given: Parallelogram $DEFG$, K and H are points on $\overrightarrow{DE}$ such that $\angle DGK \cong \angle EFH$ and $\overline{GK}$ and $\overline{FH}$ are drawn.



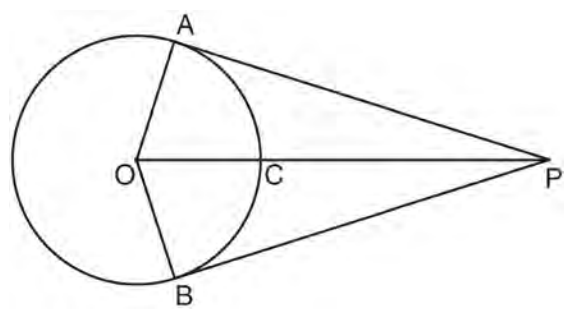
Prove: $\overline{DK} \cong \overline{EH}$

G.G.27: CIRCLE PROOFS

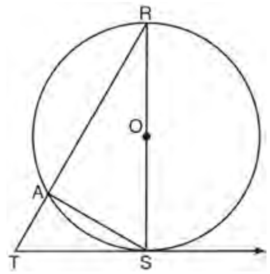
788 In the diagram below, quadrilateral $ABCD$ is inscribed in circle O, $\overline{AB} \parallel \overline{DC}$, and diagonals $\overline{AC}$ and $\overline{BD}$ are drawn. Prove that $\triangle ACD \cong \triangle BDC$.



789 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: $\angle AOP \cong \angle BOP$



790 In the diagram of circle O below, diameter $\overline{RS}$, chord $\overline{AS}$, tangent $\overrightarrow{TS}$, and secant $\overline{TAR}$ are drawn.

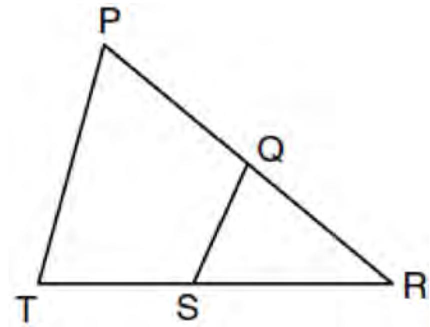


Complete the following proof to show $(RS)^2 = RA \cdot RT$

Statements	Reasons
1. circle O, diameter $\overline{RS}$, chord $\overline{AS}$, tangent $\overrightarrow{TS}$, and secant $\overline{TAR}$	1. Given
2. $\overline{RS} \perp \overrightarrow{TS}$	2. ________
3. $\angle RST$ is a right angle	3. $\perp$ lines form right angles
4. $\angle RAS$ is a right angle	4. ________
5. $\angle RST \cong \angle RAS$	5. ________
6. $\angle R \cong \angle R$	6. Reflexive property
7. $\triangle RST \sim \triangle RAS$	7. ________
8. $\frac{RS}{RA} = \frac{RT}{RS}$	8. ________
9. $(RS)^2 = RA \bullet RT$	9. ________

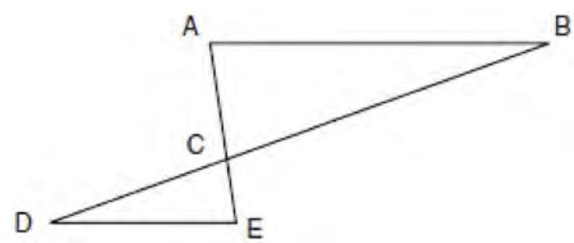
G.G.44: SIMILARITY PROOFS

791 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 $\angle RPT \cong \angle RSQ$.



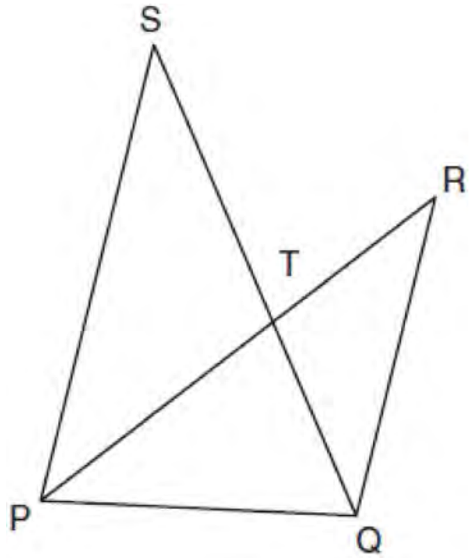
Which reason justifies the conclusion that $\triangle PRT \sim \triangle SRQ$?
1 AA
2 ASA
3 SAS
4 SSS

792 In the diagram of $\triangle ABC$ and $\triangle EDC$ below, $\overline{AE}$ and $\overline{BD}$ intersect at C, and $\angle CAB \cong \angle CED$.



Which method can be used to show that $\triangle ABC$ must be similar to $\triangle EDC$?
1 SAS
2 AA
3 SSS
4 HL

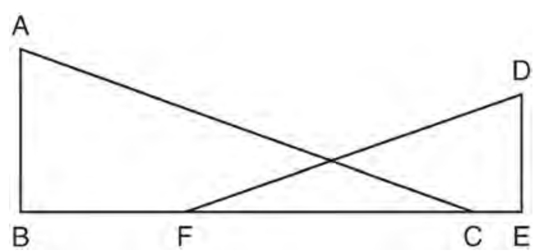
793 In the diagram below, $\overline{SQ}$ and $\overline{PR}$ intersect at T, $\overline{PQ}$ is drawn, and $\overline{PS} \parallel \overline{QR}$.



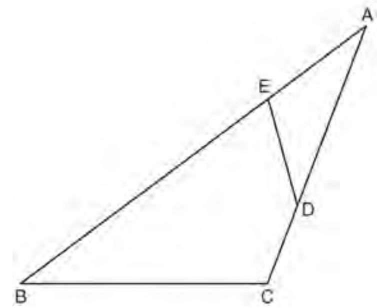
What technique can be used to prove that $\triangle PST \sim \triangle RQT$?

1 SAS
2 SSS
3 ASA
4 AA

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



795 The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. Prove that $\triangle ABC$ is similar to $\triangle ADE$.



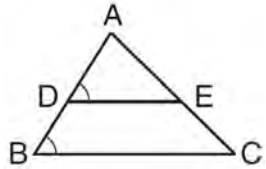
796 In $\triangle ABC$ and $\triangle DEF$, $\dfrac{AC}{DF} = \dfrac{CB}{FE}$. Which additional information would prove $\triangle ABC \sim \triangle DEF$?

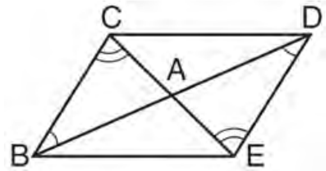
1 $AC = DF$
2 $CB = FE$
3 $\angle ACB \cong \angle DFE$
4 $\angle BAC \cong \angle EDF$

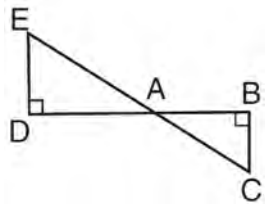
797 In triangles ABC and DEF, $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?

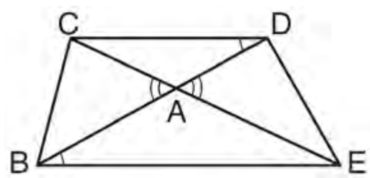
1 AA
2 SAS
3 SSS
4 ASA

798 For which diagram is the statement $\triangle ABC \sim \triangle ADE$ *not* always true??

1 

2 

3 

4 

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

1 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$ so the slope of this line is $-\frac{5}{3}$ Perpendicular lines have slope that are the opposite and reciprocal of each other.

PTS: 2 REF: fall0828ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

2 ANS: 4

The slope of $y = -\frac{2}{3}x - 5$ is $-\frac{2}{3}$. Perpendicular lines have slope that are opposite reciprocals.

PTS: 2 REF: 080917ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

3 ANS: 3

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

PTS: 2 REF: 011025ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

4 ANS: 2 PTS: 2 REF: 061022ge STA: G.G.62
TOP: Parallel and Perpendicular Lines

5 ANS: 3

$2y = -6x + 8$ Perpendicular lines have slope the opposite and reciprocal of each other.

$y = -3x + 4$

$m = -3$

$m_{\perp} = \frac{1}{3}$

PTS: 2 REF: 081024ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

6 ANS:

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

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

7 ANS: 4

The slope of $3x + 5y = 4$ is $m = \frac{-A}{B} = \frac{-3}{5}$. $m_{\perp} = \frac{5}{3}$.

PTS: 2 REF: 061127ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

8 ANS: 2

The slope of $x + 2y = 3$ is $m = \frac{-A}{B} = \frac{-1}{2}$. $m_{\perp} = 2$.

PTS: 2 REF: 081122ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

9 ANS: 2

$m = \frac{-A}{B} = \frac{-20}{-2} = 10.\ \ m_{\perp} = -\frac{1}{10}$

PTS: 2 REF: 061219ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

10 ANS: 3

The slope of $9x - 3y = 27$ is $m = \frac{-A}{B} = \frac{-9}{-3} = 3$, which is the opposite reciprocal of $-\frac{1}{3}$.

PTS: 2 REF: 081225ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

11 ANS: 2

The slope of $2x + 4y = 12$ is $m = \frac{-A}{B} = \frac{-2}{4} = -\frac{1}{2}.\ \ m_{\perp} = 2.$

PTS: 2 REF: 011310ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

12 ANS: 2

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

PTS: 2 REF: 061417ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

13 ANS: 2

$m = \frac{-A}{B} = \frac{-3}{-7} = \frac{3}{7}\ \ m_{\perp} = -\frac{7}{3}$

PTS: 2 REF: 081414ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

14 ANS:

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

$$8x - 8 = -12$$

$$8x = -4$$

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

PTS: 2 REF: 011534ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

15 ANS: 4

$$\begin{aligned} 3y + 1 &= 6x + 4. & 2y + 1 &= x - 9 \\ 3y &= 6x + 3 & 2y &= x - 10 \\ y &= 2x + 1 & y &= \frac{1}{2}x - 5 \end{aligned}$$

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

16 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

17 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

18 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

19 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

20 ANS: 2

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

$$6y = -3x + 12$$

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

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

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

21 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

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

23 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

24 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

25 ANS: 3

$m = \frac{-A}{B} = \frac{-3}{-2} = \frac{3}{2}$

PTS: 2 REF: 011324ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

26 ANS: 4

$m_{\overleftrightarrow{AB}} = \frac{6-3}{7-5} = \frac{3}{2}$. $m_{\overleftrightarrow{CD}} = \frac{4-0}{6-9} = \frac{4}{-3}$

PTS: 2 REF: 061318ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

27 ANS: 4

$$\begin{array}{ll} 3y + 6 = 2x & 2y - 3x = 6 \\ 3y = 2x - 6 & 2y = 3x + 6 \\ y = \frac{2}{3}x - 2 & y = \frac{3}{2}x + 3 \\ m = \frac{2}{3} & m = \frac{3}{2} \end{array}$$

PTS: 2 REF: 081315ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

28 ANS:

Neither. The slope of $y = \frac{1}{2}x - 1$ is $\frac{1}{2}$. The slope of $y + 4 = -\frac{1}{2}(x - 2)$ is $-\frac{1}{2}$. The slopes are neither the same nor opposite reciprocals.

PTS: 2 REF: 011433ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

29 ANS: 1

k: $\frac{-A}{B} = \frac{-1}{2}$ p: $\frac{-A}{B} = \frac{-6}{3} = -2$ m: $\frac{-A}{B} = \frac{-(-1)}{2} = \frac{1}{2}$

PTS: 2 REF: 081426ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

30 ANS: 4

$m = \frac{-A}{B} = \frac{-4}{6} = -\frac{2}{3}$

PTS: 2 REF: 011520ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

31 ANS: 4

$k: m = \frac{2}{3}$ $m: m = \frac{-A}{B} = \frac{-2}{3}$ $n: m = \frac{3}{2}$

PTS: 2 REF: 061518ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

32 ANS: 2

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

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

33 ANS: 4

The slope of $y = -3x + 2$ is -3. The perpendicular slope is $\frac{1}{3}$. $\begin{aligned} -1 &= \frac{1}{3}(3) + b \\ -1 &= 1 + b \\ b &= -2 \end{aligned}$

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

34 ANS:

$y = \frac{2}{3}x + 1$. $\begin{aligned} 2y + 3x &= 6 \\ 2y &= -3x + 6 \\ y &= -\frac{3}{2}x + 3 \\ m &= -\frac{3}{2} \\ m_{\perp} &= \frac{2}{3} \end{aligned}$. $\begin{aligned} y &= mx + b \\ 5 &= \frac{2}{3}(6) + b \\ 5 &= 4 + b \\ 1 &= b \\ y &= \frac{2}{3}x + 1 \end{aligned}$

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

35 ANS: 3 PTS: 2 REF: 011217ge STA: G.G.64

TOP: Parallel and Perpendicular Lines

36 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

37 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

38 ANS: 4

$m = \frac{2}{3}$. $2 = -\frac{3}{2}(4) + b$

$m_{\perp} = -\frac{3}{2}$ $2 = -6 + b$

$8 = b$

PTS: 2 REF: 011319ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

39 ANS: 2

$m = \frac{1}{3}$ $12 = -3(-9) + b$

$m_{\perp} = -3$ $12 = 27 + b$

$-15 = b$

PTS: 2 REF: 081404ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

40 ANS: 1

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

$$4 = -1 + b$$
$$5 = b$$

PTS: 2 REF: 061507ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

41 ANS:

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

PTS: 2 REF: 081533ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

42 ANS: 2

The slope of a line in standard form is $-\dfrac{A}{B}$, so the slope of this line is $\dfrac{-2}{-1} = 2$. A parallel line would also have a slope of 2. Since the answers are in slope intercept form, find the y-intercept:

$$\begin{aligned} y &= mx + b \\ -11 &= 2(-3) + b \\ -5 &= b \end{aligned}$$

PTS: 2 REF: fall0812ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

43 ANS:

$y = -2x + 14$. The slope of $2x + y = 3$ is $\dfrac{-A}{B} = \dfrac{-2}{1} = -2$.

$$\begin{aligned} y &= mx + b \\ 4 &= (-2)(5) + b \\ b &= 14 \end{aligned}$$

.

PTS: 2 REF: 060931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

44 ANS:

$y = \dfrac{2}{3}x - 9$. The slope of $2x - 3y = 11$ is $-\dfrac{A}{B} = \dfrac{-2}{-3} = \dfrac{2}{3}$.

$$\begin{aligned} -5 &= \left(\frac{2}{3}\right)(6) + b \\ -5 &= 4 + b \\ b &= -9 \end{aligned}$$

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

45 ANS: 4

The slope of a line in standard form is $-\dfrac{A}{B}$, so the slope of this line is $\dfrac{-4}{2} = -2$. A parallel line would also have a slope of -2. Since the answers are in slope intercept form, find the y-intercept:

$$\begin{aligned} y &= mx + b \\ 3 &= -2(7) + b \\ 17 &= b \end{aligned}$$

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

46 ANS: 4

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

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

47 ANS: 2

The slope of a line in standard form is $\frac{-A}{B}$, so the slope of this line is $\frac{-4}{3}$. A parallel line would also have a slope of $\frac{-4}{3}$. Since the answers are in standard form, use the point-slope formula.

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

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

48 ANS: 2

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

$$\begin{aligned} y&=mx+b \\ 2&=-2(2)+b \\ 6&=b \end{aligned}$$

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

49 ANS: 3

$$\begin{aligned} y&=mx+b \\ -1&=2(2)+b \\ -5&=b \end{aligned}$$

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

50 ANS: 4

$m=\frac{-A}{B}=\frac{-3}{2}$.

$$\begin{aligned} y&=mx+b \\ -1&=\left(\frac{-3}{2}\right)(2)+b \\ -1&=-3+b \\ 2&=b \end{aligned}$$

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

51 ANS: 1

$m=\frac{3}{2}$

$$\begin{aligned} y&=mx+b \\ 2&=\frac{3}{2}(1)+b \\ \frac{1}{2}&=b \end{aligned}$$

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

52 ANS: 3

$$2y = 3x - 4. \quad 1 = \frac{3}{2}(6) + b$$
$$y = \frac{3}{2}x - 2 \quad 1 = 9 + b$$
$$-8 = b$$

PTS: 2 REF: 061316ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

53 ANS: 2

$$m = \frac{-A}{B} = \frac{-5}{1} = -5 \quad y = mx + b$$
$$3 = -5(5) + b$$
$$28 = b$$

PTS: 2 REF: 011410ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

54 ANS: 1

$$m = \frac{-A}{B} = \frac{1}{2} \quad -1 = \frac{1}{2}(4) + b$$
$$-1 = 2 + b$$
$$-3 = b$$

PTS: 2 REF: 061420ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

55 ANS: 2 PTS: 2 REF: 081421ge STA: G.G.65
TOP: Parallel and Perpendicular Lines

56 ANS:

$$m = \frac{1}{3} \quad 4 = \frac{1}{3}(-3) + b \quad y = \frac{1}{3}x + 5$$
$$4 = -1 + b$$
$$5 = b$$

PTS: 2 REF: 011532ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

57 ANS: 4

$$\frac{2}{3}(x - 4) = y - 5$$
$$2x - 8 = 3y - 15$$
$$7 = 3y - 2x$$

PTS: 2 REF: 061528ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

58 ANS: 3

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

$1 = 2(-2) + b$

$1 = -4 + b$

$5 = b$

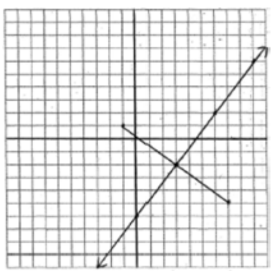
PTS: 2 REF: 081509ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

59 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

60 ANS: 1

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

$4 = 2(4) + b$

$-4 = b$

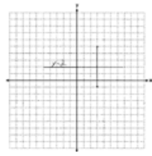
PTS: 2 REF: 081126ge STA: G.G.68 TOP: Perpendicular Bisector

61 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

62 ANS:

$M = \left(\frac{3+3}{2}, \frac{-1+5}{2}\right) = (3,2)$. $y = 2$. 

PTS: 2 REF: 011334ge STA: G.G.68 TOP: Perpendicular Bisector

63 ANS: 3

midpoint: $\left(\frac{6+8}{2}, \frac{8+4}{2}\right) = (7,6)$. slope: $\frac{8-4}{6-8} = \frac{4}{-2} = -2$; $m_{\perp} = \frac{1}{2}$.

$$6 = \frac{1}{2}(7) + b$$
$$\frac{12}{2} = \frac{7}{2} + b$$
$$\frac{5}{12} = b$$

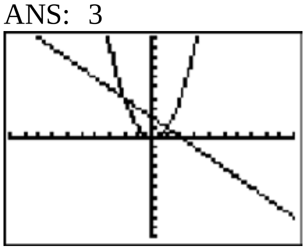
PTS: 2 REF: 081327ge STA: G.G.68 TOP: Perpendicular Bisector

64 ANS:

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

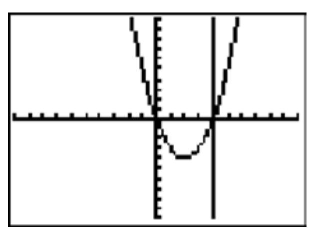
PTS: 4 REF: 081536ge STA: G.G.68 TOP: Perpendicular Bisector

65 ANS: 3



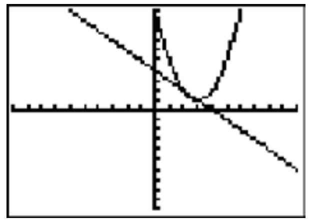
PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

66 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

67 ANS: 4



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

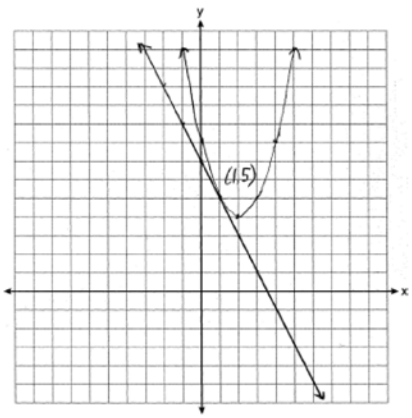
$y = -x + 4$ $\quad x^2 - 5x + 6 = 0$ $\quad y + 3 = 4$ $\quad y = 2$

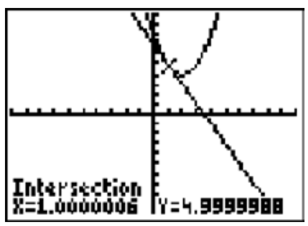
$(x - 3)(x - 2) = 0$ $\quad y = 1$

$x = 3 \text{ or } 2$

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

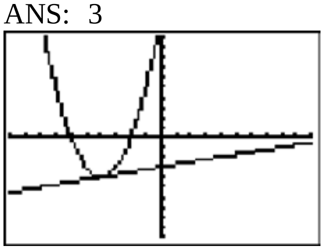
68 ANS:





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

69 ANS: 3



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

70 ANS: 3

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

$$x^2 + 6x + 9 - 4 = 2x + 5$$

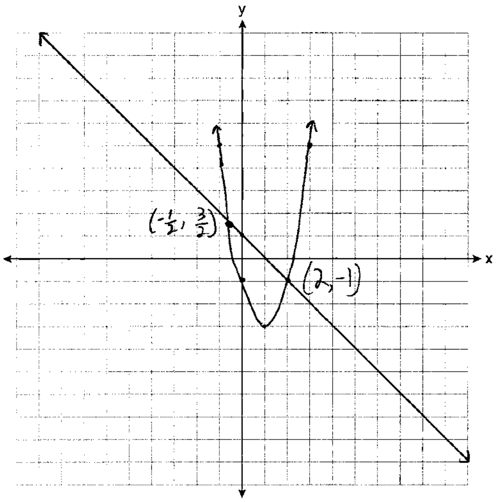
$$x^2 + 4x = 0$$

$$x(x + 4) = 0$$

$$x = 0, -4$$

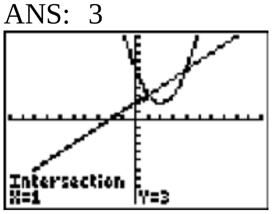
PTS: 2 REF: 081004ge STA: G.G.70 TOP: Quadratic-Linear Systems

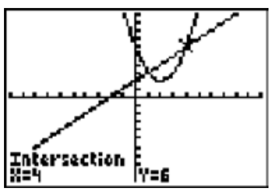
71 ANS:



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

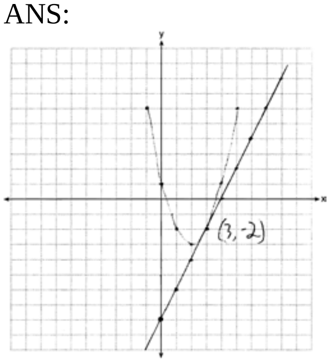
72 ANS: 3





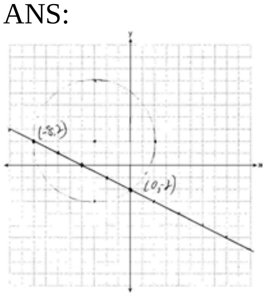
PTS: 2 REF: 081118ge STA: G.G.70 TOP: Quadratic-Linear Systems

73 ANS:



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

74 ANS:



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

75 ANS: 3

$$x^2 + 5^2 = 25$$
$$x = 0$$

PTS: 2 REF: 011312ge STA: G.G.70 TOP: Quadratic-Linear Systems

76 ANS: 2 PTS: 2 REF: 061313ge STA: G.G.70

TOP: Quadratic-Linear Systems

77 ANS: 2

$$(x-4)^2 - 2 = -2x + 6. \quad y = -2(4) + 6 = -2$$
$$x^2 - 8x + 16 - 2 = -2x + 6 \quad y = -2(2) + 6 = 2$$
$$x^2 - 6x + 8 = 0$$
$$(x-4)(x-2) = 0$$
$$x = 4, 2$$

PTS: 2 REF: 081319ge STA: G.G.70 TOP: Quadratic-Linear Systems

78 ANS: 2

$$x^2 - 2 = x$$
$$x^2 - x - 2 = 0$$
$$(x-2)(x+1) = 0$$
$$x = 2, -1$$

PTS: 2 REF: 011409ge STA: G.G.70 TOP: Quadratic-Linear Systems

79 ANS: 2

$$x + 2x = x^2 \quad (0,0), (3,3)$$
$$0 = x^2 - 3x$$
$$0 = x(x-3)$$
$$x = 0, 3$$

PTS: 2 REF: 061406ge STA: G.G.70 TOP: Quadratic-Linear Systems

80 ANS: 1

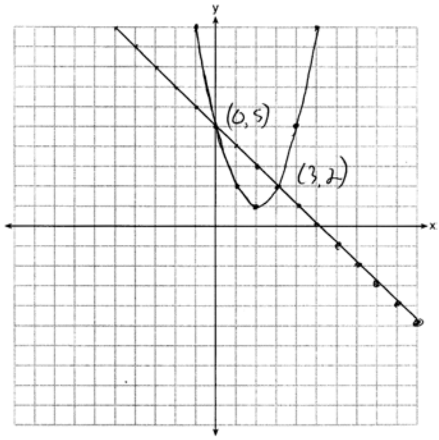
$$x^2 + 5 = x + 5 \quad y = (0) + 5 = 5$$
$$x^2 - x = 0 \quad y = (1) + 5 = 6$$
$$x(x-1) = 0$$
$$x = 0, 1$$

PTS: 2 REF: 081406ge STA: G.G.70 TOP: Quadratic-Linear Systems

81 ANS: 4 PTS: 2 REF: 011501ge STA: G.G.70

TOP: Quadratic-Linear Systems

82 ANS:



PTS: 4 REF: 061535ge STA: G.G.70 TOP: Quadratic-Linear Systems

83 ANS: 4

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

PTS: 2 REF: 081516ge STA: G.G.70 TOP: Quadratic-Linear Systems

84 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

85 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

86 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

87 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

88 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

89 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

90 ANS:

$(2a-3, 3b+2)$. $\left(\dfrac{3a+a-6}{2}, \dfrac{2b-1+4b+5}{2}\right) = \left(\dfrac{4a-6}{2}, \dfrac{6b+4}{2}\right) = (2a-3, 3b+2)$

PTS: 2 REF: 061134ge STA: G.G.66 TOP: Midpoint

91 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

92 ANS: 4

$$-5 = \frac{-3+x}{2}. \qquad 2 = \frac{6+y}{2}$$
$$-10 = -3 + x \qquad 4 = 6 + y$$
$$-7 = x \qquad -2 = y$$

PTS: 2 REF: 081203ge STA: G.G.66 TOP: Midpoint

93 ANS: 3

$$6=\frac{4+x}{2}. \qquad 8=\frac{2+y}{2}.$$

$4+x=12 \qquad 2+y=16$

$x=8 \qquad y=14$

PTS: 2 REF: 011305ge STA: G.G.66 TOP: Midpoint

94 ANS: 2

$M_x=\frac{8+(-3)}{2}=2.5.\ M_Y=\frac{-4+2}{2}=-1.$

PTS: 2 REF: 061312ge STA: G.G.66 TOP: Midpoint

95 ANS: 2

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

$x=2 \qquad y=8$

PTS: 2 REF: 011401ge STA: G.G.66 TOP: Midpoint

96 ANS: 1

$M_x=\frac{-5+3}{2}=\frac{-2}{2}=-1.\ M_y=\frac{1+5}{2}=\frac{6}{2}=3.$

PTS: 2 REF: 061402ge STA: G.G.66 TOP: Midpoint

97 ANS: 3

$M_x=\frac{1+10}{2}=\frac{11}{2}=5.5\ M_y=\frac{3+7}{2}=\frac{10}{2}=5.$

PTS: 2 REF: 081407ge STA: G.G.66 TOP: Midpoint
KEY: graph

98 ANS: 4

$M_x=\frac{2+8}{2}=5.\ M_Y=\frac{-5+3}{2}=-1.$

PTS: 2 REF: 011502ge STA: G.G.66 TOP: Midpoint
KEY: general

99 ANS: 2

$$2=\frac{10+x}{2}. \qquad 8=\frac{12+y}{2}$$

$4=10+x \qquad 16=12+y$

$-6=x \qquad 4=y$

PTS: 2 REF: 061505ge STA: G.G.66 TOP: Midpoint

100 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

101 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

102 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

103 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

104 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

105 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

106 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

107 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

108 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

109 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

110 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

111 ANS:

$\sqrt{(-1-3)^2 + (4-(-2))^2} = \sqrt{16+36} = \sqrt{52} = \sqrt{4}\sqrt{13} = 2\sqrt{13}$

PTS: 2 REF: 081331ge STA: G.G.67 TOP: Distance

112 ANS:

$\sqrt{(3-7)^2 + (-4-2)^2} = \sqrt{16+36} = \sqrt{52} = \sqrt{4}\sqrt{13} = 2\sqrt{13}$.

PTS: 2 REF: 011431ge STA: G.G.67 TOP: Distance

113 ANS: 3

$d = \sqrt{(-2-4)^2 + (3-5)^2} = \sqrt{36+4} = \sqrt{40} = 2\sqrt{10}$

PTS: 2 REF: 061411ge STA: G.G.67 TOP: Distance
KEY: general

114 ANS: 2 PTS: 2 REF: 081415ge STA: G.G.67
TOP: Distance KEY: general

115 ANS: 1

$d = \sqrt{(5-1)^2 + (3-6)^2} = \sqrt{16+9} = \sqrt{25} = 5$

PTS: 2 REF: 011507ge STA: G.G.67 TOP: Distance
KEY: general

116 ANS:

$\sqrt{(6-3)^2 + (-1-8)^2} = \sqrt{9+81} = \sqrt{90} = \sqrt{9}\sqrt{10} = 3\sqrt{10}$.

PTS: 2 REF: 061533ge STA: G.G.67 TOP: Distance

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

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

119	ANS: 3	PTS: 2	REF: 061017ge	STA: G.G.1
	TOP: Planes			
120	ANS: 4	PTS: 2	REF: 061118ge	STA: G.G.1
	TOP: Planes			
121	ANS: 3	PTS: 2	REF: 081218ge	STA: G.G.1
	TOP: Planes			
122	ANS: 4	PTS: 2	REF: 011315ge	STA: G.G.1
	TOP: Planes			
123	ANS: 3	PTS: 2	REF: 061522ge	STA: G.G.1
	TOP: Planes			
124	ANS: 1	PTS: 2	REF: 060918ge	STA: G.G.2
	TOP: Planes			
125	ANS: 1	PTS: 2	REF: 011128ge	STA: G.G.2
	TOP: Planes			
126	ANS: 1	PTS: 2	REF: 061310ge	STA: G.G.2
	TOP: Planes			
127	ANS: 1	PTS: 2	REF: 081514ge	STA: G.G.2
	TOP: Planes			
128	ANS: 1	PTS: 2	REF: 011024ge	STA: G.G.3
	TOP: Planes			
129	ANS: 1	PTS: 2	REF: 081008ge	STA: G.G.3
	TOP: Planes			
130	ANS: 1	PTS: 2	REF: 011218ge	STA: G.G.3
	TOP: Planes			
131	ANS: 1	PTS: 2	REF: 061418ge	STA: G.G.3
	TOP: Planes			
132	ANS: 1	PTS: 2	REF: 011512ge	STA: G.G.3
	TOP: Planes			
133	ANS: 1	PTS: 2	REF: 061514ge	STA: G.G.3
	TOP: Planes			
134	ANS: 2	PTS: 2	REF: 080927ge	STA: G.G.4
	TOP: Planes			
135	ANS: 4	PTS: 2	REF: 061213ge	STA: G.G.5
	TOP: Planes			

136 ANS: 3

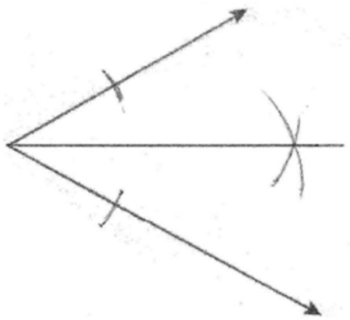
As originally administered, this question read, "Which fact is *not* sufficient to show that planes $\mathcal{R}$ and $\mathcal{S}$ are perpendicular?" The State Education Department stated that since a correct solution was not provided for Question 11, all students shall be awarded credit for this question.

	PTS: 2	REF: 081211ge	STA: G.G.5	TOP: Planes
137	ANS: 4	PTS: 2	REF: 080914ge	STA: G.G.7
	TOP: Planes			
138	ANS: 1	PTS: 2	REF: 081116ge	STA: G.G.7
	TOP: Planes			
139	ANS: 3	PTS: 2	REF: 060928ge	STA: G.G.8
	TOP: Planes			

140 ANS: 2 PTS: 2 REF: 081120ge STA: G.G.8
TOP: Planes
141 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes
142 ANS: 3 PTS: 2 REF: 081002ge STA: G.G.9
TOP: Planes
143 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes
144 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes
145 ANS: 4 PTS: 2 REF: 061203ge STA: G.G.9
TOP: Planes
146 ANS: 4 PTS: 2 REF: 011306ge STA: G.G.9
TOP: Planes
147 ANS: 1 PTS: 2 REF: 081323ge STA: G.G.9
TOP: Planes
148 ANS: 1 PTS: 2 REF: 011404ge STA: G.G.9
TOP: Planes
149 ANS: 3 PTS: 2 REF: 061401ge STA: G.G.9
TOP: Planes
150 ANS: 3
The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids
151 ANS: 4 PTS: 2 REF: 061003ge STA: G.G.10
TOP: Solids
152 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids
153 ANS: 1 PTS: 2 REF: 011221ge STA: G.G.10
TOP: Solids
154 ANS: 2 PTS: 2 REF: 081311ge STA: G.G.10
TOP: Solids
155 ANS: 4 PTS: 2 REF: 011406ge STA: G.G.10
TOP: Solids
156 ANS: 4 PTS: 2 REF: 081401ge STA: G.G.10
TOP: Solids
157 ANS: 1 PTS: 2 REF: 011526ge STA: G.G.10
TOP: Solids
158 ANS: 4 PTS: 2 REF: 061503ge STA: G.G.10
TOP: Solids
159 ANS: 1 PTS: 2 REF: 081508ge STA: G.G.10
TOP: Solids
160 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids
161 ANS: 2 PTS: 2 REF: 061315ge STA: G.G.13
TOP: Solids

162 ANS:

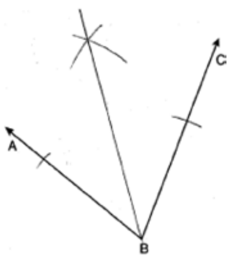


PTS: 2 REF: fall0832ge STA: G.G.17 TOP: Constructions

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

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

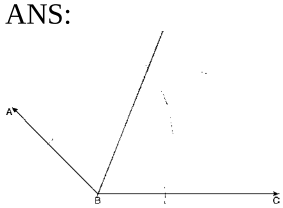
165 ANS:



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

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

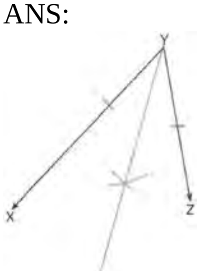
167 ANS:



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

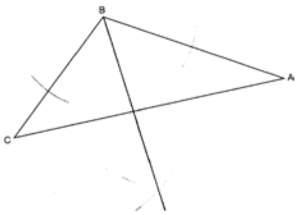
168 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions

169 ANS:



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

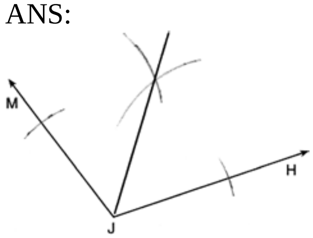
170 ANS:



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

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

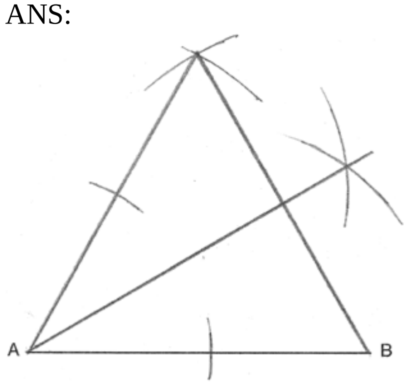
172 ANS:



PTS: 2 REF: 081330ge STA: G.G.17 TOP: Constructions

173 ANS: 3 PTS: 2 REF: 011402ge STA: G.G.17
TOP: Constructions

174 ANS:



PTS: 4 REF: 061437ge STA: G.G.17 TOP: Constructions

175 ANS: 2 PTS: 2 REF: 011509ge STA: G.G.17
TOP: Constructions

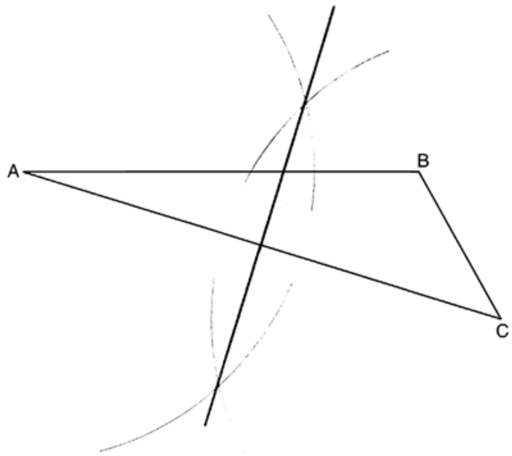
176 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions

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

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

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

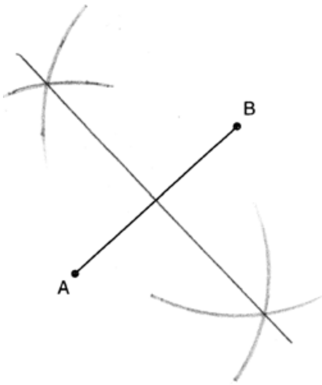
180 ANS:



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

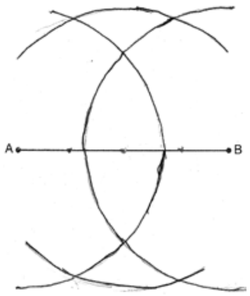
181 ANS: 2 PTS: 2 REF: 061305ge STA: G.G.18
TOP: Constructions

182 ANS:



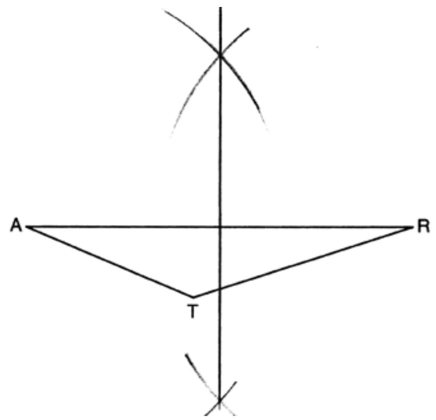
PTS: 2 REF: 011430ge STA: G.G.18 TOP: Constructions

183 ANS:



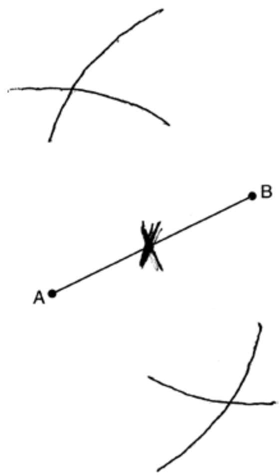
PTS: 4 REF: 081437ge STA: G.G.18 TOP: Constructions

184 ANS:



PTS: 2 REF: 011530ge STA: G.G.18 TOP: Constructions

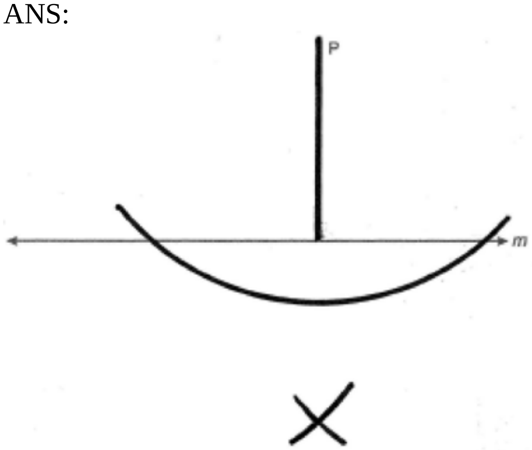
185 ANS:



PTS: 2 REF: 061532ge STA: G.G.18 TOP: Constructions

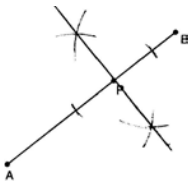
186 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions

187 ANS:

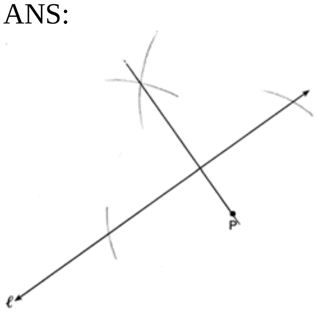


PTS: 2 REF: 060930ge STA: G.G.19 TOP: Constructions

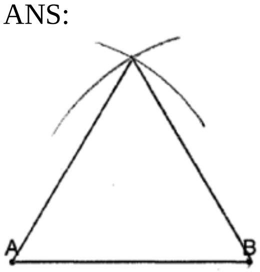
188 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19
TOP: Constructions
189 ANS: 2 PTS: 2 REF: 061020ge STA: G.G.19
TOP: Constructions
190 ANS: 2 PTS: 2 REF: 061208ge STA: G.G.19
TOP: Constructions
191 ANS:



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

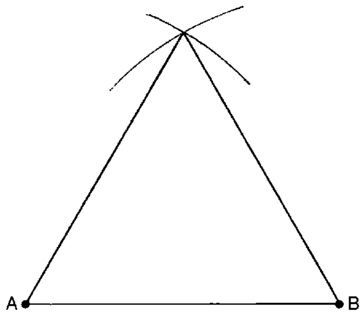


PTS: 2 REF: 011333ge STA: G.G.19 TOP: Constructions
193 ANS: 4 PTS: 2 REF: 081313ge STA: G.G.19
TOP: Constructions
194 ANS: 2 PTS: 2 REF: 061512ge STA: G.G.19
TOP: Constructions
195 ANS: 3 PTS: 2 REF: 081512ge STA: G.G.19
TOP: Constructions
196 ANS:



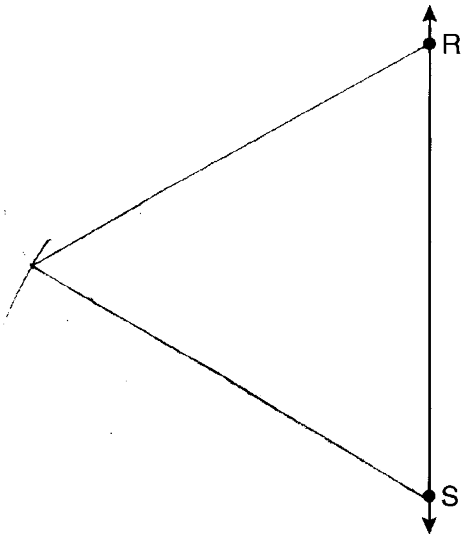
PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions
197 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions

198 ANS:



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

199 ANS:

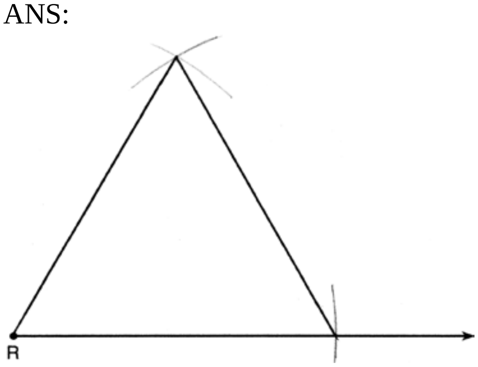


PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

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

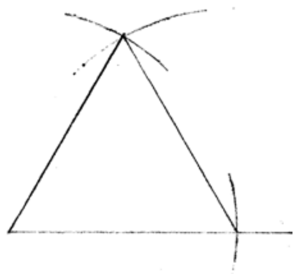
201 ANS: 3 PTS: 2 REF: 011309ge STA: G.G.20
TOP: Constructions

202 ANS:



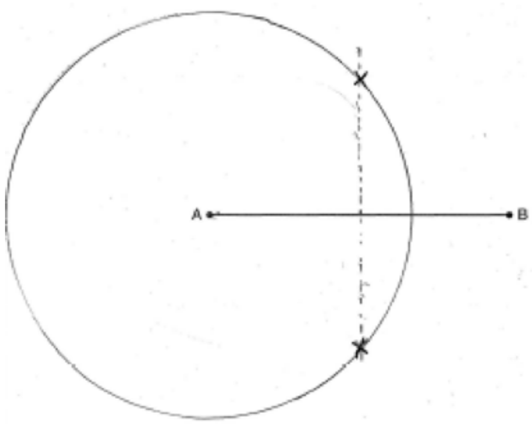
PTS: 2 REF: 061332ge STA: G.G.20 TOP: Constructions

203 ANS:



PTS: 2 REF: 081532ge STA: G.G.20 TOP: Constructions

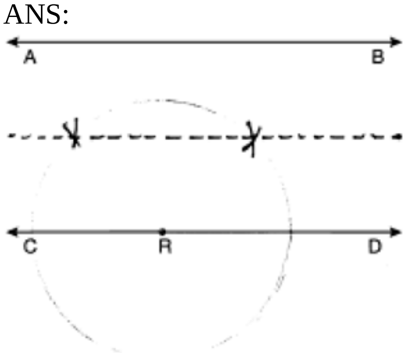
204 ANS:



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

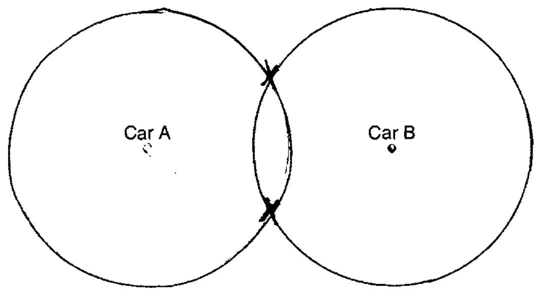
205 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

206 ANS:



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

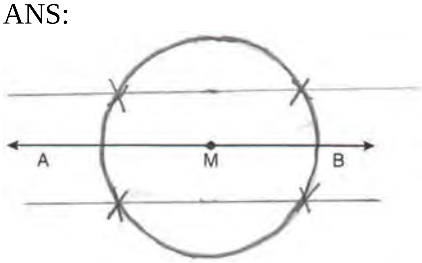
207 ANS:



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

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

209 ANS:

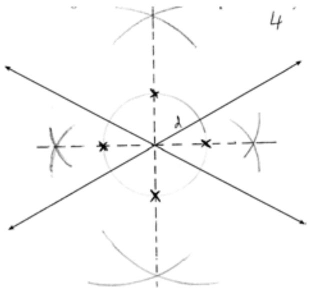


PTS: 2 REF: 011230ge STA: G.G.22 TOP: Locus

210 ANS: 2 PTS: 2 REF: 011317ge STA: G.G.22
TOP: Locus

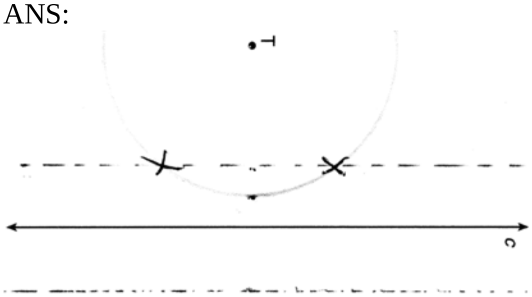
211 ANS: 4 PTS: 2 REF: 061303ge STA: G.G.22
TOP: Locus

212 ANS:



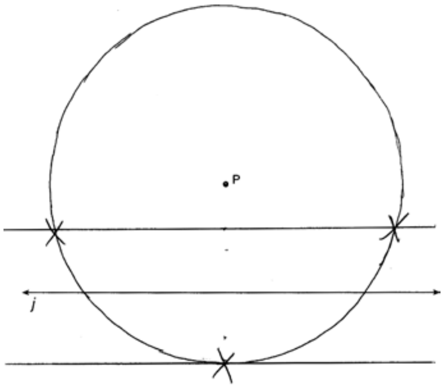
PTS: 2 REF: 081334ge STA: G.G.22 TOP: Locus

213 ANS:



PTS: 2 REF: 011434ge STA: G.G.22 TOP: Locus

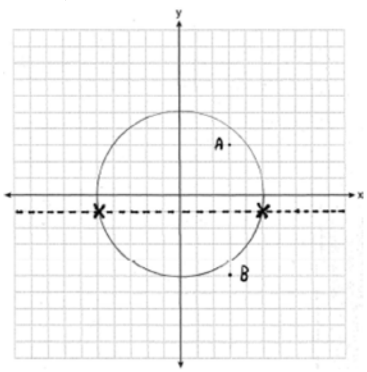
214 ANS:



PTS: 4 REF: 061537ge STA: G.G.22 TOP: Locus

215 ANS: 1 PTS: 2 REF: 081522ge STA: G.G.22
TOP: Locus

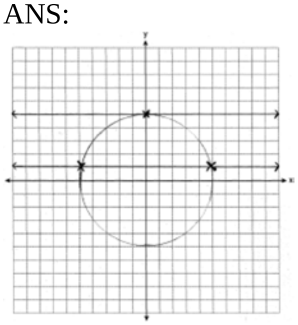
216 ANS:



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

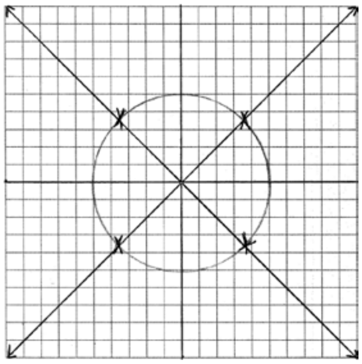
217 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

218 ANS:



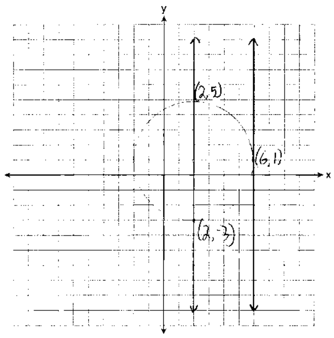
PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

219 ANS:



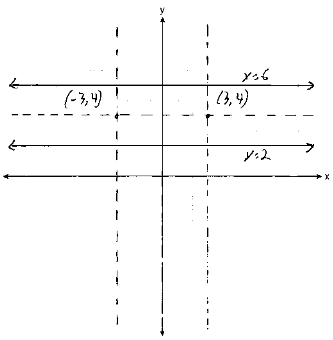
PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

220 ANS:



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

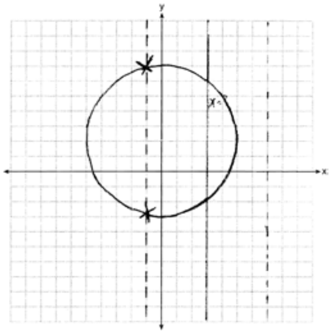
221 ANS:



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

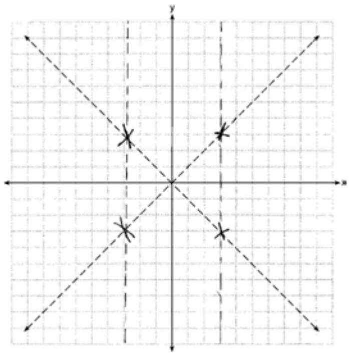
222 ANS: 2 PTS: 2 REF: 081117ge STA: G.G.23
TOP: Locus

223 ANS:



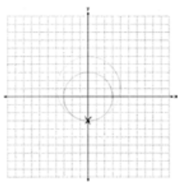
PTS: 2 REF: 061234ge STA: G.G.23 TOP: Locus

224 ANS:



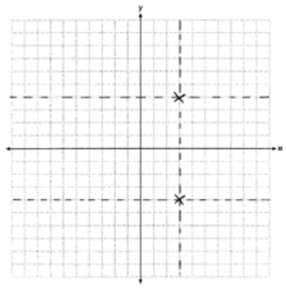
PTS: 2 REF: 081234ge STA: G.G.23 TOP: Locus

225 ANS:



PTS: 2 REF: 011331ge STA: G.G.23 TOP: Locus

226 ANS:

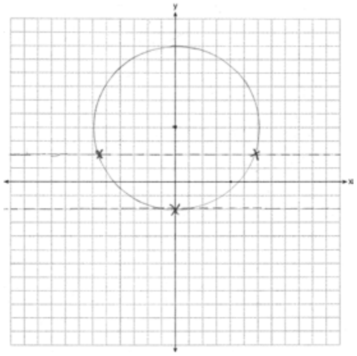


PTS: 2 REF: 061333ge STA: G.G.23 TOP: Locus

227 ANS: 2 PTS: 2 REF: 081316ge STA: G.G.23
TOP: Locus

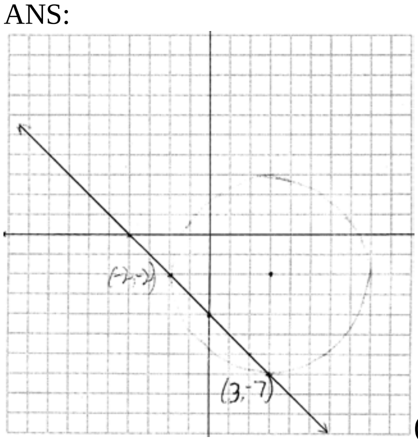
228 ANS: 4 PTS: 2 REF: 011407ge STA: G.G.23
TOP: Locus

229 ANS:



PTS: 4 REF: 061436ge STA: G.G.23 TOP: Locus

230 ANS:



$(x-3)^2+(y+2)^2=25$ $m=\dfrac{-6--4}{0-2}=\dfrac{-2}{-2}=1$ $M\left(\dfrac{0+2}{2},\dfrac{-6+-4}{2}\right)=M(1,-5)$

$m_{\perp}=-1$

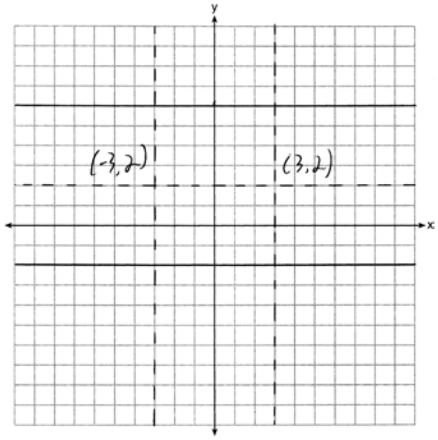
$-5=(-1)(1)+b$

$-4=b$

$y=-x-4$

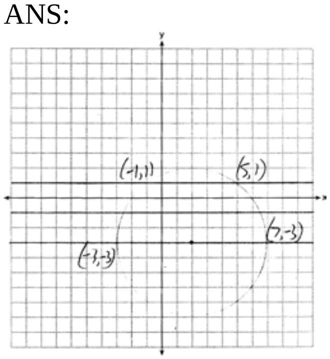
PTS: 6 REF: 081438ge STA: G.G.23 TOP: Locus

231 ANS:



PTS: 4 REF: 011536ge STA: G.G.23 TOP: Locus

232 ANS:



PTS: 4 REF: 081535ge STA: G.G.23 TOP: Locus

233 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

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

235 ANS:

Yes, $m\angle ABD = m\angle BDC = 44$ $180 - (93 + 43) = 44$ $x + 19 + 2x + 6 + 3x + 5 = 180$. Because alternate interior

$$\begin{aligned} 6x + 30 &= 180 \\ 6x &= 150 \\ x &= 25 \\ x + 19 &= 44 \end{aligned}$$

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

236 ANS: 2

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

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

237 ANS: 3

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

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

238 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

239 ANS:

$$180 - (90 + 63) = 27$$

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

240 ANS: 3

$$4x + 14 + 8x + 10 = 180$$
$$12x = 156$$
$$x = 13$$

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

241 ANS: 3 PTS: 2 REF: 061320ge STA: G.G.35
TOP: Parallel Lines and Transversals

242 ANS: 1

$$7x - 36 + 5x + 12 = 180$$
$$12x - 24 = 180$$
$$12x = 204$$
$$x = 17$$

PTS: 2 REF: 011422ge STA: G.G.35 TOP: Parallel Lines and Transversals

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

243 ANS: 2

$$5x-22=3x+10$$
$$2x=32$$
$$x=16$$

PTS: 2 REF: 061403ge STA: G.G.35 TOP: Parallel Lines and Transversals

244 ANS: 4

$$2x+36+7x-9=180 \quad m\angle 1=2(17)+36=70$$
$$9x+27=180$$
$$9x=153$$
$$x=17$$

PTS: 2 REF: 081427ge STA: G.G.35 TOP: Parallel Lines and Transversals

245 ANS: 4

$$3x+17+5x-21=180 \quad m\angle 1=3(23)+17=86$$
$$8x-4=180$$
$$8x=184$$
$$x=23$$

PTS: 2 REF: 011513ge STA: G.G.35 TOP: Parallel Lines and Transversals

246 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

247 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

248 ANS: 3

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

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

249 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

250 ANS: 2

$2^2 + 3^2 \neq 4^2$

PTS: 2 REF: 011316ge STA: G.G.48 TOP: Pythagorean Theorem

251 ANS: 4

$8^2 + 15^2 = 17^2$

PTS: 2 REF: 081418ge STA: G.G.48 TOP: Pythagorean Theorem

252 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

253 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

254 ANS:
26. $\begin{aligned} x+3x+5x-54&=180 \\ 9x&=234 \\ x&=26 \end{aligned}$

PTS: 2 REF: 080933ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

255 ANS: 1

$$\begin{aligned} x+2x+2+3x+4&=180 \\ 6x+6&=180 \\ x&=29 \end{aligned}$$

PTS: 2 REF: 011002ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

256 ANS:
34. $\begin{aligned} 2x-12+x+90&=180 \\ 3x+78&=90 \\ 3x&=102 \\ x&=34 \end{aligned}$

PTS: 2 REF: 061031ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

257 ANS: 1

$$\begin{aligned} 3x+5+4x-15+2x+10&=180. \\ 9x&=180 \\ x&=20 \end{aligned}$$ $m\angle D=3(20)+5=65$. $m\angle E=4(20)-15=65$.

PTS: 2 REF: 061119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

258 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

259 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

260 ANS: 4 PTS: 2 REF: 081206ge STA: G.G.30
TOP: Interior and Exterior Angles of Triangles

261 ANS: 1

$\frac{180-52}{2}=64$. $180-(90+64)=26$

PTS: 2 REF: 011314ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

262 ANS: 3

$$\begin{aligned} 3x+1+4x-17+5x-20 &= 180. \quad 3(18)+1=55 \\ 12x-36 &= 180 \quad 4(18)-17=55 \\ 12x &= 216 \quad 5(18)-20=70 \\ x &= 18 \end{aligned}$$

PTS: 2 REF: 061308ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

263 ANS:

$$\begin{aligned} A &= 2B-15 \\ C &= A+B \\ C &= 2B-15+B \end{aligned} \quad . \quad \begin{aligned} 2B-15+B+2B-15+B &= 180 \\ 6B-30 &= 180 \\ 6B &= 210 \\ B &= 35 \end{aligned}$$

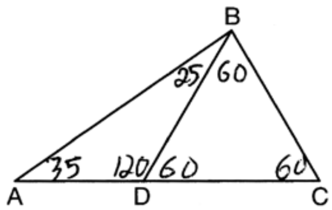
PTS: 2 REF: 081332ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

264 ANS: 3

$$\frac{4}{2+3+4}\times 180 = 80$$

PTS: 2 REF: 061404ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

265 ANS: 1



PTS: 2 REF: 011504ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

266 ANS:

$$\frac{5}{5+6+7}\cdot 180 = 50$$

PTS: 2 REF: 061529ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

267 ANS: 4

$180-(40+40)=100$

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

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

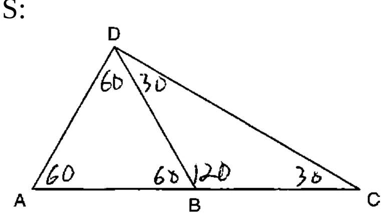
269 ANS:

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

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

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

271 ANS:



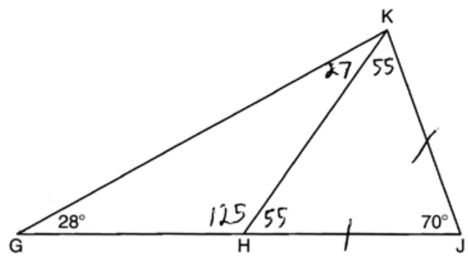
30.

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

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

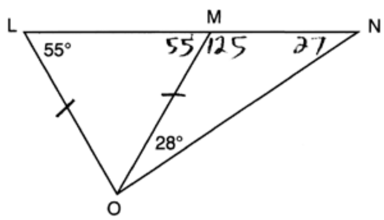
273 ANS:

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



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

274 ANS: 1



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

275 ANS: 2

$$3x + x + 20 + x + 20 = 180$$
$$5x = 40$$
$$x = 28$$

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

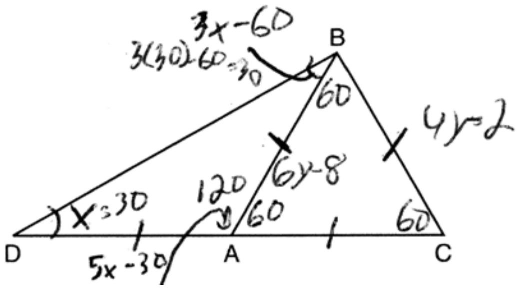
276 ANS:

$$\begin{aligned} x+3x-60+5x-30&=180\\ 9x-90&=180\\ 9x&=270\\ x&=30=m\angle D \end{aligned}$$

$$\begin{aligned} 5(30)-30&=120\\ m\angle BAC&=180-120=60 \end{aligned}$$

$$\begin{aligned} 6y-8&=4y-2\\ 2y&=6\\ y&=3\\ 4(3)-2&=10=\overline{BC} \end{aligned}$$

$$\overline{DC}=10+10=20$$



PTS: 3 REF: 011435ge STA: G.G.31 TOP: Isosceles Triangle Theorem

277 ANS: 2

$$\begin{aligned} x+x+x+15&=180\\ 3x+15&=180\\ 3x&=165\\ x&=15 \end{aligned}$$

PTS: 2 REF: 061407ge STA: G.G.31 TOP: Isosceles Triangle Theorem

278 ANS: 3

$$\begin{aligned} x+40&=2x+20\\ 20&=x \end{aligned} \quad GH=2(20)+20=60$$

PTS: 2 REF: 081416ge STA: G.G.31 TOP: Isosceles Triangle Theorem

279 ANS: 4

$$180-\frac{180-80}{2}=130$$

PTS: 2 REF: 011508ge STA: G.G.31 TOP: Isosceles Triangle Theorem

280 ANS: 2

$180-2(58)=64$

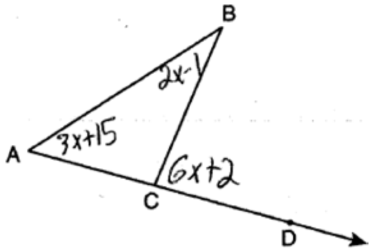
PTS: 2 REF: 081510ge STA: G.G.31 TOP: Isosceles Triangle Theorem

281 ANS: 4

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

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

282 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

283 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

284 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

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

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

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

288 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

289 ANS: 4

$6x = x + 40 + 3x + 10.$ $m\angle CAB = 25 + 40 = 65$

$6x = 4x + 50$

$2x = 50$

$x = 25$

PTS: 2 REF: 081310ge STA: G.G.32 TOP: Exterior Angle Theorem

290 ANS: 2

$m\angle ABC = 55$, so $m\angle ACR = 60 + 55 = 115$

PTS: 2 REF: 011414ge STA: G.G.32 TOP: Exterior Angle Theorem

291 ANS: 2

$x^2 + 5x = 4x + 110$ $m\angle Q = 4(10) = 40$

$x^2 + x - 110 = 0$

$(x + 11)(x - 10) = 0$

$10 = x$

PTS: 2 REF: 061425ge STA: G.G.32 TOP: Exterior Angle Theorem

292 ANS: 1

$m\angle A + m\angle B = 50$

$30.1 + m\angle B = 50$

$m\angle B = 19.9$

PTS: 2 REF: 081424ge STA: G.G.32 TOP: Exterior Angle Theorem

293 ANS: 3 PTS: 2 REF: 061508ge STA: G.G.32
TOP: Exterior Angle Theorem

294 ANS: 2

$7 + 18 > 6 + 12$

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

295 ANS: 2

$6 + 17 > 22$

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

296 ANS: 2

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

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

297 ANS: 4

$3 + 6 > 8$

PTS: 2 REF: 061416ge STA: G.G.33 TOP: Triangle Inequality Theorem

298 ANS: 1
$10 - 4 < s < 10 + 4$

$6 < s < 14$

PTS: 2 REF: 011519ge STA: G.G.33 TOP: Triangle Inequality Theorem
299 ANS: 4
$11 - 7 = 4, 11 + 7 = 18$

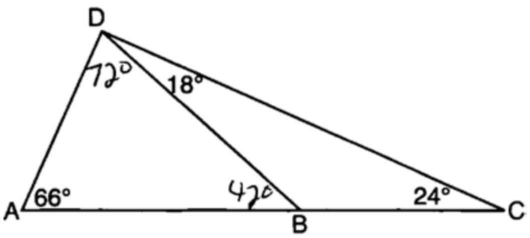
PTS: 2 REF: 061525ge STA: G.G.33 TOP: Triangle Inequality Theorem
300 ANS: 2 PTS: 2 REF: 081527ge STA: G.G.33
TOP: Triangle Inequality Theorem
301 ANS: 2
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 060911ge STA: G.G.34 TOP: Angle Side Relationship
302 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
303 ANS: 1 PTS: 2 REF: 061010ge STA: G.G.34
TOP: Angle Side Relationship
304 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
305 ANS: 4
$m\angle A = 80$

PTS: 2 REF: 011115ge STA: G.G.34 TOP: Angle Side Relationship
306 ANS: 4 PTS: 2 REF: 011222ge STA: G.G.34
TOP: Angle Side Relationship
307 ANS: 1



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

308 ANS:

$x^2+12+11x+5+13x-17=180$. $m\angle A=6^2+12=48$. $\angle B$ is the largest angle, so $\overline{AC}$ in the longest side.

$$x^2+24x-180=0 \qquad m\angle B=11(6)+5=71$$
$$(x+30)(x-6)=0 \qquad m\angle C=13(6)-7=61$$
$$x=6$$

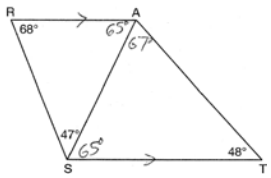
PTS: 4 REF: 011337ge STA: G.G.34 TOP: Angle Side Relationship

309 ANS: 2 PTS: 2 REF: 061321ge STA: G.G.34
TOP: Angle Side Relationship

310 ANS: 2 PTS: 2 REF: 081306ge STA: G.G.34
TOP: Angle Side Relationship

311 ANS: 1 PTS: 2 REF: 011416ge STA: G.G.34
TOP: Angle Side Relationship

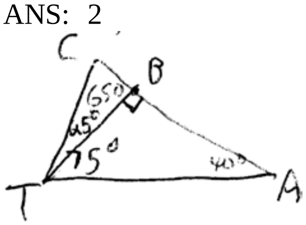
312 ANS:



$\overline{ST}$

PTS: 2 REF: 061430ge STA: G.G.34 TOP: Angle Side Relationship

313 ANS: 2



PTS: 2 REF: 081422ge STA: G.G.34 TOP: Angle Side Relationship

314 ANS: 2 PTS: 2 REF: 011510ge STA: G.G.34
TOP: Angle Side Relationship

315 ANS: 1 PTS: 2 REF: 061523ge STA: G.G.34
TOP: Angle Side Relationship

316 ANS: 1 PTS: 2 REF: 081524ge STA: G.G.34
TOP: Angle Side Relationship

317 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

318 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

319 ANS: 2

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

$3x = 42$

$x = 14$

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

320 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

321 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

322 ANS: 3

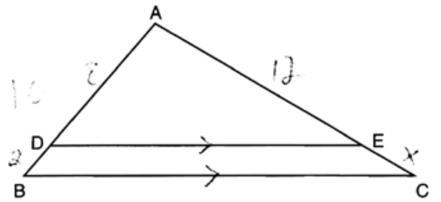
$\frac{5}{7} = \frac{10}{x}$

$5x = 70$

$x = 14$

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

323 ANS: 3



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

$8x = 24$

$x = 3$

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

324 ANS: 3

$\frac{12}{8} = \frac{21}{x} \quad 21 + 14 = 35$

$12x = 168$

$x = 14$

PTS: 2 REF: 061426ge STA: G.G.46 TOP: Side Splitter Theorem

325 ANS: 2

$\frac{3}{6} = \frac{5}{x}$

$3x = 30$

$x = 10$

PTS: 2 REF: 081423ge STA: G.G.46 TOP: Side Splitter Theorem

326 ANS: 3

$\frac{4}{6} = \frac{x+2}{4x-7}$

$16x - 28 = 6x + 12$

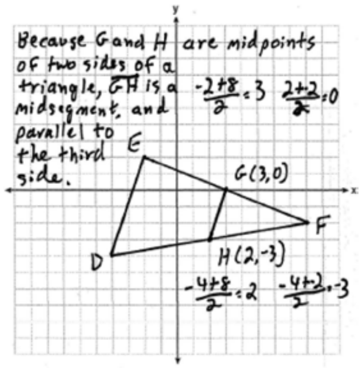
$10x = 40$

$x = 4$

PTS: 2 REF: 011521ge STA: G.G.46 TOP: Side Splitter Theorem

327 ANS: 3 PTS: 2 REF: 081507ge STA: G.G.46
TOP: Side Splitter Theorem

328 ANS:

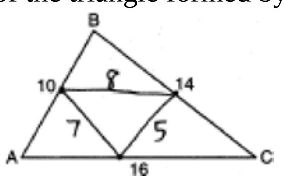


PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments

329 ANS:

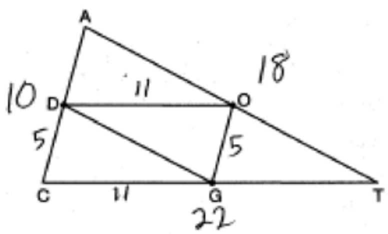
20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5+7+8=20$.



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

330 ANS: 3



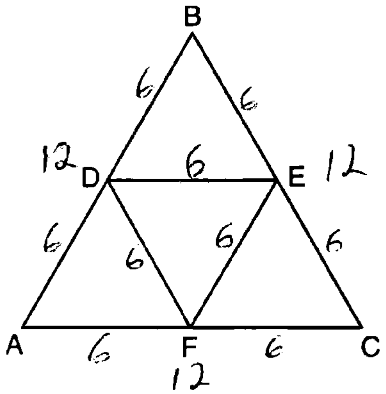
PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

331 ANS:

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

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

332 ANS: 1



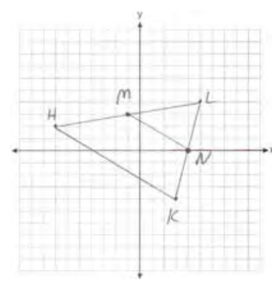
PTS: 2 REF: 081003ge STA: G.G.42 TOP: Midsegments

333 ANS: 2

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

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

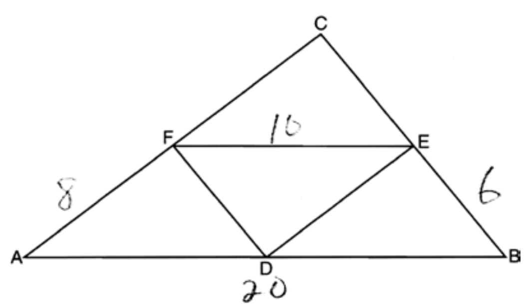
334 ANS:



$M\left(\frac{-7+5}{2}, \frac{2+4}{2}\right) = M(-1,3)$. $N\left(\frac{3+5}{2}, \frac{-4+4}{2}\right) = N(4,0)$. $\overline{MN}$ is a midsegment.

PTS: 4 REF: 011237ge STA: G.G.42 TOP: Midsegments

335 ANS: 4



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

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

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

337 ANS: 3 PTS: 2 REF: 011311ge STA: G.G.42
TOP: Midsegments

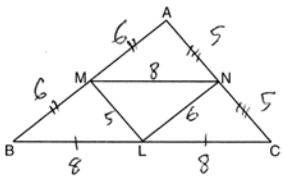
338 ANS: 3

$$3x - 15 = 2(6)$$
$$3x = 27$$
$$x = 9$$

PTS: 2 REF: 061311ge STA: G.G.42 TOP: Midsegments

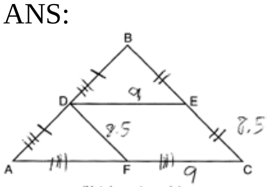
339 ANS: 3 PTS: 2 REF: 081320ge STA: G.G.42
TOP: Midsegments

340 ANS: 1



PTS: 2 REF: 011413ge STA: G.G.42 TOP: Midsegments

341 ANS:

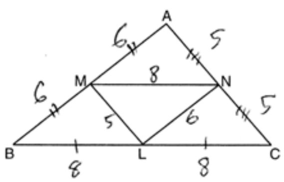


(Not drawn to scale)

$8.5 + 9 + 8.5 + 9 = 35$

PTS: 2 REF: 081430ge STA: G.G.42 TOP: Midsegments

342 ANS: 4



PTS: 2 REF: 061520ge STA: G.G.42 TOP: Midsegments

343 ANS:

$$2x + 7 = 25 \quad NT = 4.5$$
$$2x = 18$$
$$x = 9$$

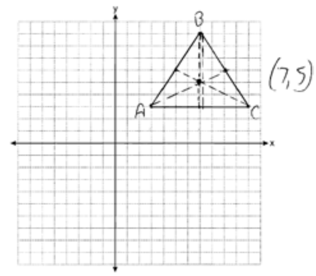
PTS: 2 REF: 081531ge STA: G.G.42 TOP: Midsegments

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

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

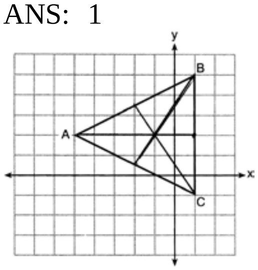
346 ANS: 4
$\overline{BG}$ is also an angle bisector since it intersects the concurrence of $\overline{CD}$ and $\overline{AE}$

PTS: 2 REF: 061025ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter
347 ANS: 1 PTS: 2 REF: 081028ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
348 ANS: 3 PTS: 2 REF: 011110ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter
349 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
350 ANS: 3 PTS: 2 REF: 011202ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
351 ANS: 1 PTS: 2 REF: 061214ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
352 ANS: 4 PTS: 2 REF: 081224ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
353 ANS: 1



PTS: 2 REF: 011516ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
354 ANS:

$$180 - \left(\frac{84}{2} + 28\right) = 180 - 70 = 110$$

PTS: 2 REF: 061534ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

355 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

356 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

357 ANS: 1
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

$$\begin{aligned} \overline{GC} &= 2\overline{FG} \\ \overline{GC} + \overline{FG} &= 24 \\ 2\overline{FG} + \overline{FG} &= 24 \\ 3\overline{FG} &= 24 \\ \overline{FG} &= 8 \end{aligned}$$

PTS: 2 REF: 081018ge STA: G.G.43 TOP: Centroid

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

359 ANS: 1
$7x + 4 = 2(2x + 5)$. $PM = 2(2) + 5 = 9$

$$\begin{aligned} 7x + 4 &= 4x + 10 \\ 3x &= 6 \\ x &= 2 \end{aligned}$$

PTS: 2 REF: 011226ge STA: G.G.43 TOP: Centroid

360 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

361 ANS: 3
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 081307ge STA: G.G.43 TOP: Centroid

362 ANS: 1
$2x + x = 12$. $\overline{BD} = 2(4) = 8$

$$\begin{aligned} 3x &= 12 \\ x &= 4 \end{aligned}$$

PTS: 2 REF: 011408ge STA: G.G.43 TOP: Centroid

363 ANS: 3 PTS: 2 REF: 061424ge STA: G.G.43
TOP: Centroid

364 ANS:
$5x = 2(x+12)$ $QM = 5(8)+(8)+12 = 60$

$5x = 2x+24$

$3x = 24$

$x = 8$

PTS: 2 REF: 081433ge STA: G.G.43 TOP: Centroid

365 ANS: 1 PTS: 2 REF: 061527ge STA: G.G.43
TOP: Centroid

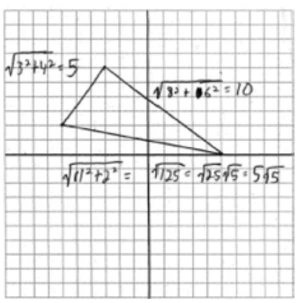
366 ANS: 3
$2.4+2(2.4) = 7.2$

PTS: 2 REF: 081526ge STA: G.G.43 TOP: Centroid

367 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

368 ANS:



$15+5\sqrt{5}$.

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

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

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

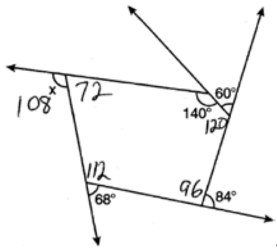
371 ANS: 3
$AB = 8-4 = 4$. $BC = \sqrt{(-2-(-5))^2+(8-6)^2} = \sqrt{13}$. $AC = \sqrt{(-2-(-5))^2+(4-6)^2} = \sqrt{13}$

PTS: 2 REF: 011328ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

372 ANS:
$\sqrt{(7-3)^2+(-8-0)^2} = \sqrt{16+64} = \sqrt{80} = 4\sqrt{5}$

PTS: 2 REF: 061331ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

373 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

374 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

375 ANS: 3

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

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

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

377 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

378 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

379 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

380 ANS:

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

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

381 ANS: 2

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

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

382 ANS: 2

$$\begin{aligned}\frac{(n-2)180}{n} &= 120\ .\\ 180n - 360 &= 120n\\ 60n &= 360\\ n &= 6\end{aligned}$$

PTS: 2 REF: 011326ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

383 ANS:

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

PTS: 2 REF: 061330ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

384 ANS: 4

$$(n-2)180 - n\left(\frac{(n-2)180}{n}\right) = 180n - 360 - 180n + 180n - 360 = 180n - 720.$$

$180(5) - 720 = 180$

PTS: 2 REF: 081322ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

385 ANS: 3

The regular polygon with the smallest interior angle is an equilateral triangle, with 60º. $180° - 60° = 120°$

PTS: 2 REF: 011417ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

386 ANS: 2

$$\begin{aligned}180 - \frac{(n-2)180}{n} &= 45\\ 180n - 180n + 360 &= 45n\\ 360 &= 45n\\ n &= 8\end{aligned}$$

PTS: 2 REF: 061413ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

387 ANS:

$(n-2)180 = 540. \quad \frac{540}{5} = 108$

$n-2 = 3$

$n = 5$

PTS: 2 REF: 081434ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

388 ANS:

$\frac{(n-2)180}{n} = \frac{(10-2)180}{10} = 144$

PTS: 2 REF: 011531ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

389 ANS: 3

$180 - \frac{(n-2)180}{n} = 40$

$180n - 180n + 360 = 40n$

$360 = 40n$

$n = 9$

PTS: 2 REF: 061519ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

390 ANS: 2

$180(n-2) = 720$

$n-2 = 4$

$n = 6$

PTS: 2 REF: 061521ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

391 ANS: 2

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

PTS: 2 REF: 081521ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

392 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

393 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

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

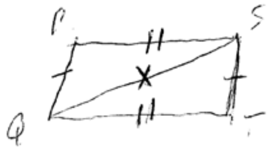
395 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms

396 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

397 ANS: 3



PTS: 2 REF: 081402ge STA: G.G.38 TOP: Parallelograms

398 ANS: 2 PTS: 2 REF: 011522ge STA: G.G.38
TOP: Parallelograms

399 ANS:
$6x - 6 = 4x + 2$ $m\angle BCA = 4(4) + 2 = 18$ $7y - 15 = 5y - 1$ $m\angle BAC = 5(7) - 1 = 34$ $m\angle B = 180 - (18 + 34) = 128$

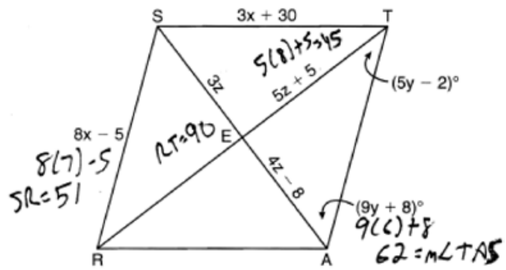
$$2x = 8 \qquad 2y = 14$$
$$x = 4 \qquad y = 7$$

PTS: 4 REF: 061536ge STA: G.G.38 TOP: Parallelograms

400 ANS: 2
$$L + L - 30 = 180$$
$$2L = 210$$
$$L = 105$$

PTS: 2 REF: 081519ge STA: G.G.38 TOP: Parallelograms

401 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

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

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

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

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

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

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

407 ANS: 2
The diagonals of a rhombus are perpendicular. $180-(90+12)=78$

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

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

409 ANS: 4
$2x-8=x+2.$ $AE=10+2=12.$ $AC=2(AE)=2(12)=24$

$x=10$

PTS: 2 REF: 011327ge STA: G.G.39 TOP: Special Parallelograms

410 ANS: 2
$\sqrt{8^2+15^2}=17$

PTS: 2 REF: 061326ge STA: G.G.39 TOP: Special Parallelograms

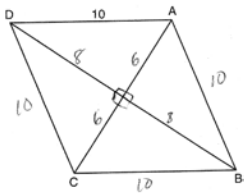
411 ANS: 2

$$s^2 + s^2 = (3\sqrt{2})^2$$
$$2s^2 = 18$$
$$s^2 = 9$$
$$s = 3$$

PTS: 2 REF: 011420ge STA: G.G.39 TOP: Special Parallelograms

412 ANS: 3 PTS: 2 REF: 011425ge STA: G.G.39
TOP: Special Parallelograms

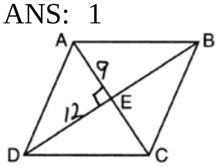
413 ANS: 2



PTS: 2 REF: 061414ge STA: G.G.39 TOP: Special Parallelograms

414 ANS: 3 PTS: 2 REF: 081419ge STA: G.G.39
TOP: Special Parallelograms

415 ANS: 1



$\sqrt{9^2 + 12^2} = 15$

PTS: 2 REF: 011505ge STA: G.G.39 TOP: Special Parallelograms

416 ANS: 3

Diagonals of rectangles and trapezoids do not bisect opposite angles. $m\angle DAB = 90$ if $ABCD$ is a square.

PTS: 2 REF: 061511ge STA: G.G.39 TOP: Special Parallelograms

417 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

418 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

419 ANS: 2

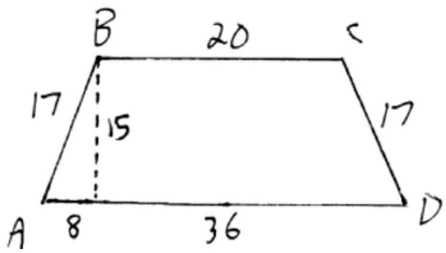
The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+30}{2}=44.$

$$x+30=88$$
$$x=58$$

PTS: 2 REF: 011001ge STA: G.G.40 TOP: Trapezoids

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

421 ANS: 3



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

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

422 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

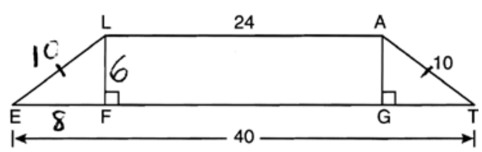
423 ANS: 4

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

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

424 ANS: 1

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



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

425 ANS: 1

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

$$6x-6=4x+4$$
$$2x=10$$
$$x=5$$

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

426 ANS: 3

$2(4x+20)+2(3x-15)=360.$ $\angle D=3(25)-15=60$

$$8x+40+6x-30=360$$
$$14x+10=360$$
$$14x=350$$
$$x=25$$

PTS: 2 REF: 011321ge STA: G.G.40 TOP: Trapezoids

427 ANS: 2

Isosceles or not, $\triangle RSV$ and $\triangle RST$ have a common base, and since $\overline{RS}$ and $\overline{VT}$ are bases, congruent altitudes.

PTS: 2 REF: 061301ge STA: G.G.40 TOP: Trapezoids

428 ANS:

$12x-4+7x+13=180.$ $16y+1=\dfrac{12y+1+18y+6}{2}$

$$19x+9=180 \qquad 32y+2=30y+7$$
$$19x=171 \qquad 2y=5$$
$$x=9 \qquad y=\frac{5}{2}$$

PTS: 4 REF: 081337ge STA: G.G.40 TOP: Trapezoids

429 ANS: 1

$180-123=57$

PTS: 2 REF: 061419ge STA: G.G.40 TOP: Trapezoids

430 ANS: 2

$5x+3=7x-15$ $5(9)+3=48$

$$18=2x$$
$$9=x$$

PTS: 2 REF: 011515ge STA: G.G.40 TOP: Trapezoids

431 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41

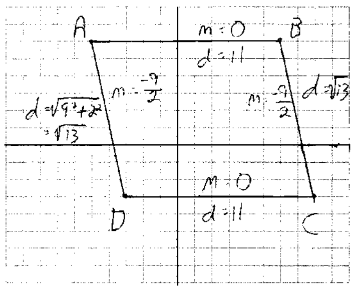
TOP: Special Quadrilaterals

432 ANS: 1 PTS: 2 REF: 081517ge STA: G.G.41
TOP: Special Quadrilaterals

433 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

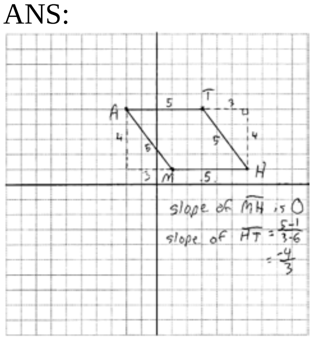
434 ANS:



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

435 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

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

$$\mathrm{m}_{FE} = \frac{3--2}{4-0} = \frac{5}{4}$$

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

437 ANS: 1

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

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

438 ANS: 2

$\sqrt{(-2-4)^2+(-3-(-1))^2} = \sqrt{40} = \sqrt{4}\sqrt{10} = 2\sqrt{10}$

PTS: 2 REF: 011313ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

439 ANS:

$m_{\overline{AB}} = \frac{4-1}{4-2} = \frac{3}{2}$. $m_{\overline{BC}} = -\frac{2}{3}$

PTS: 4 REF: 061334ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

440 ANS:

$M\left(\frac{-7+-3}{2},\frac{4+6}{2}\right)=M(-5,5)$. $m_{\overline{MN}}=\frac{5-3}{-5-0}=\frac{2}{-5}$. Since both opposite sides have equal slopes and are

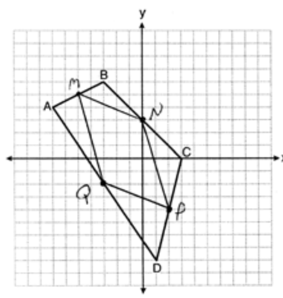
$N\left(\frac{-3+3}{2},\frac{6+0}{2}\right)=N(0,3)$ $\quad m_{\overline{PQ}}=\frac{-4--2}{2--3}=\frac{-2}{5}$

$P\left(\frac{3+1}{2},\frac{0+-8}{2}\right)=P(2,-4)$ $\quad m_{\overline{NA}}=\frac{3--4}{0-2}=\frac{7}{-2}$

$Q\left(\frac{-7+1}{2},\frac{4+-8}{2}\right)=Q(-3,-2)$ $\quad m_{\overline{QM}}=\frac{-2-5}{-3--5}=\frac{-7}{2}$

parallel, *MNPQ* is a parallelogram. $\overline{MN}=\sqrt{(-5-0)^2+(5-3)^2}=\sqrt{29}$. $\overline{MN}$ is not congruent to $\overline{NP}$, so *MNPQ*

$\overline{NA}=\sqrt{(0-2)^2+(3--4)^2}=\sqrt{53}$



is not a rhombus since not all sides are congruent.

PTS: 6 REF: 081338ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

441 ANS:

$m_{\overline{JM}}=\frac{1-4}{-3-3}=\frac{-3}{-6}=\frac{1}{2}$ Since both opposite sides have equal slopes and are parallel, *JKLM* is a parallelogram.

$m_{\overline{ML}}=\frac{4--2}{3-7}=\frac{6}{-4}=-\frac{3}{2}$

$m_{\overline{LK}}=\frac{-2--5}{7-1}=\frac{3}{6}=\frac{1}{2}$

$m_{\overline{KJ}}=\frac{-5-1}{1--3}=\frac{-6}{4}=-\frac{3}{2}$

$\overline{JM}=\sqrt{(-3-3)^2+(1-4)^2}=\sqrt{45}$. $\overline{JM}$ is not congruent to $\overline{ML}$, so *JKLM* is not a rhombus since not all sides

$\overline{ML}=\sqrt{(7-3)^2+(-2-4)^2}=\sqrt{52}$

are congruent.

PTS: 6 REF: 061438ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

442 ANS: 3

Both pairs of opposite sides are parallel, so not a trapezoid. None of the angles are right angles, so not a rectangle or square. All sides are congruent, so a rhombus.

PTS: 2 REF: 081411ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

443 ANS:

$$\left(\frac{0+1}{2},\frac{4+-4}{2}\right)$$

$$\left(\frac{1}{2},0\right)$$

PTS: 2 REF: 081534ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

444 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 $ED = 4$, $BD = 8$.

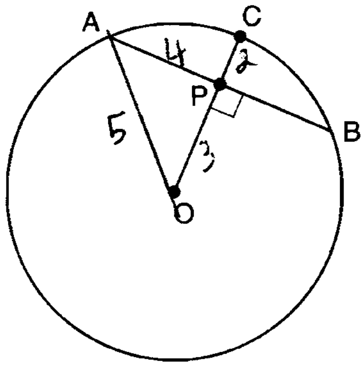
PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

445 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

446 ANS: 3



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

447 ANS: 4

$\sqrt{6^2-2^2} = \sqrt{32} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$

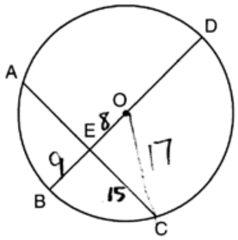
PTS: 2 REF: 081124ge STA: G.G.49 TOP: Chords

448 ANS:

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

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

449 ANS: 2



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

PTS: 2 REF: 061221ge STA: G.G.49 TOP: Chords

450 ANS: 3 PTS: 2 REF: 011322ge STA: G.G.49
TOP: Chords

451 ANS:

$2(y+10) = 4y - 20$. $\overline{DF} = y + 10 = 20 + 10 = 30$. $\overline{OA} = \overline{OD} = \sqrt{16^2 + 30^2} = 34$

$$\begin{aligned} 2y + 20 &= 4y - 20 \\ 40 &= 2y \\ 20 &= y \end{aligned}$$

PTS: 4 REF: 061336ge STA: G.G.49 TOP: Chords

452 ANS: 4 PTS: 2 REF: 081308ge STA: G.G.49
TOP: Chords

453 ANS: 2

$\sqrt{17^2 - 15^2} = \sqrt{289 - 225} = \sqrt{64} = 8$

PTS: 2 REF: 011424ge STA: G.G.49 TOP: Chords

454 ANS: 4 PTS: 2 REF: 081403ge STA: G.G.49
TOP: Chords

455 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 and Secants

456 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 and Secants

457 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061001ge STA: G.G.52 TOP: Chords and Secants

458 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061105ge STA: G.G.52 TOP: Chords and Secants

459 ANS:
$\frac{180-80}{2}=50$

PTS: 2 REF: 081129ge STA: G.G.52 TOP: Chords and Secants

460 ANS:
$2x-20=x+20$. $\text{m}\overset{\frown}{AB}=x+20=40+20=60$
$x=40$

PTS: 2 REF: 011229ge STA: G.G.52 TOP: Chords and Secants

461 ANS: 3
$\frac{180-70}{2}=55$

PTS: 2 REF: 061205ge STA: G.G.52 TOP: Chords and Secants

462 ANS: 4
Parallel lines intercept congruent arcs.

PTS: 2 REF: 081201ge STA: G.G.52 TOP: Chords and Secants

463 ANS: 2
Parallel chords intercept congruent arcs. $\frac{360-(104+168)}{2}=44$

PTS: 2 REF: 011302ge STA: G.G.52 TOP: Chords and Secants

464 ANS: 1
Parallel chords intercept congruent arcs. $\text{m}\overset{\frown}{AC}=\text{m}\overset{\frown}{BD}$. $\frac{180-110}{2}=35$.

PTS: 2 REF: 081302ge STA: G.G.52 TOP: Chords and Secants

465 ANS: 3
Parallel lines intercept congruent arcs.

PTS: 2 REF: 061409ge STA: G.G.52 TOP: Chords and Secants

466 ANS: 1
Parallel lines intercept congruent arcs.

PTS: 2 REF: 081413ge STA: G.G.52 TOP: Chords and Secants

467 ANS: 4
$9x-10=5x+30$ $5(10)+30=80$
$4x=40$
$x=10$

PTS: 2 REF: 011525ge STA: G.G.52 TOP: Chords and Secants

468 ANS: 2 PTS: 2 REF: 061516ge STA: G.G.52
TOP: Chords and Secants

469 ANS: 2

Parallel secants intercept congruent arcs. $\dfrac{360-(106+24)}{2}=\dfrac{230}{2}=115$

PTS: 2 REF: 081503ge STA: G.G.52 TOP: Chords and Secants

470 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
TOP: Tangents KEY: common tangency

471 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

472 ANS: 3 PTS: 2 REF: 080928ge STA: G.G.50
TOP: Tangents KEY: common tangency

473 ANS: 1 PTS: 2 REF: 061013ge STA: G.G.50
TOP: Tangents KEY: point of tangency

474 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50
TOP: Tangents KEY: two tangents

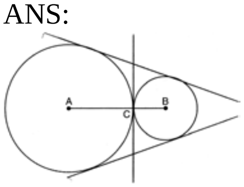
475 ANS: 4

$\sqrt{25^2-7^2}=24$

PTS: 2 REF: 081105ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

476 ANS: 2 PTS: 2 REF: 081214ge STA: G.G.50
TOP: Tangents KEY: point of tangency

477 ANS:



PTS: 2 REF: 011330ge STA: G.G.50 TOP: Tangents
KEY: common tangency

478 ANS: 2

$\sqrt{15^2-12^2}=9$

PTS: 2 REF: 081325ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

479 ANS: 3

$180-38=142$

PTS: 2 REF: 011419ge STA: G.G.50 TOP: Tangents
KEY: two tangents

480 ANS: 2
$180 - 2(66) = 48$

PTS: 2 REF: 061513ge STA: G.G.50 TOP: Tangents
KEY: two tangents

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

481 ANS: 4 PTS: 2 REF: 011428ge STA: G.G.50
TOP: Tangents KEY: common tangency

482 ANS:

$$x^2 + 7^2 = 25^2$$
$$x^2 + 49 = 625$$
$$x^2 = 576$$
$$x = 24$$

PTS: 2 REF: 061433ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

483 ANS: 3

$$\sqrt{20^2 + 7^2} \approx 21$$

PTS: 2 REF: 081525ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

484 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°. $\text{m}\overset{\frown}{FE} = \frac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by $\overset{\frown}{FE}$, their measure is 24°. $\text{m}\overset{\frown}{GD} = \frac{7}{15} \times 360 = 168$. Since the chords forming $\angle E$ and $\angle F$ are intercepted by $\overset{\frown}{GD}$, their measure is 84°.

PTS: 4 REF: fall0836ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

485 ANS: 2

$$\frac{87 + 35}{2} = \frac{122}{2} = 61$$

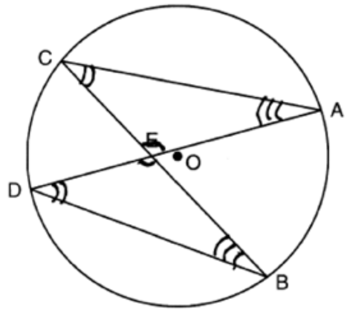
PTS: 2 REF: 011015ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

486 ANS: 3

$$\frac{36 + 20}{2} = 28$$

PTS: 2 REF: 061019ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

487 ANS: 2



PTS: 2 REF: 061026ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

488 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

489 ANS: 4 PTS: 2 REF: 011124ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

490 ANS:

30. $3x+4x+5x=360$. $\text{m}\overset{\frown}{LN}:\text{m}\overset{\frown}{NK}:\text{m}\overset{\frown}{KL}=90:120:150$. $\dfrac{150-90}{2}=30$

$x=20$

PTS: 4 REF: 061136ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

491 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

492 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

493 ANS: 1

$$\frac{70-20}{2}=25$$

PTS: 2 REF: 011325ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

494 ANS: 2 PTS: 2 REF: 061322ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

495 ANS:

$86°\cdot 2=172°$ $180°-86°=94°$

PTS: 2 REF: 081432ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

496 ANS: 3 PTS: 2 REF: 011523ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

497 ANS: 1 PTS: 2 REF: 081518ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

498 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

499 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

500 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

501 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

502 ANS: 2

$(d+4)4=12(6)$

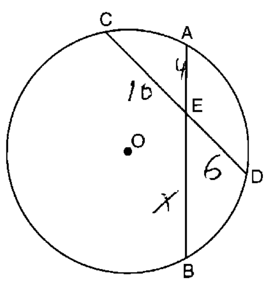
$4d+16=72$

$d=14$

$r=7$

PTS: 2 REF: 061023ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

503 ANS: 1

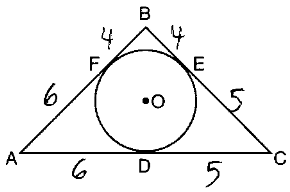


$4x=6\cdot 10$

$x=15$

PTS: 2 REF: 081017ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

504 ANS: 3



PTS: 2 REF: 011101ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two tangents

505 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

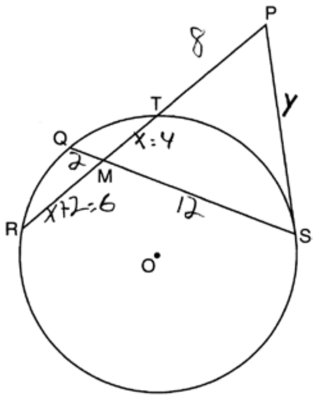
506 ANS: 4

$$4(x+4) = 8^2$$
$$4x + 16 = 64$$
$$4x = 48$$
$$x = 12$$

PTS: 2 REF: 061117ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

507 ANS: 4 PTS: 2 REF: 011208ge STA: G.G.53
TOP: Segments Intercepted by Circle KEY: two tangents

508 ANS:



$$x(x+2) = 12 \cdot 2. \quad \overline{RT} = 6+4 = 10. \quad y \cdot y = 18 \cdot 8$$

$$x^2 + 2x - 24 = 0 \qquad y^2 = 144$$

$$(x+6)(x-4) = 0 \qquad y = 12$$

$$x = 4$$

PTS: 4 REF: 061237ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

509 ANS: 1

$12(8) = x(6)$

$96 = 6x$

$16 = x$

PTS: 2 REF: 061328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

510 ANS: 1

$8 \times 12 = 16x$

$6 = x$

PTS: 2 REF: 081328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

511 ANS:

$24 \cdot 6 = w \cdot 8$

$144 = 8w$

$18 = w$

PTS: 2 REF: 011533ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

512 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

513 ANS: 2 PTS: 2 REF: 060910ge STA: G.G.71
TOP: Equations of Circles

514 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71
TOP: Equations of Circles

515 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

516 ANS: 3 PTS: 2 REF: 011116ge STA: G.G.71
TOP: Equations of Circles

517 ANS: 4 PTS: 2 REF: 081110ge STA: G.G.71
TOP: Equations of Circles

518 ANS: 4 PTS: 2 REF: 011212ge STA: G.G.71
TOP: Equations of Circles

519 ANS: 3 PTS: 2 REF: 061210ge STA: G.G.71
TOP: Equations of Circles

520 ANS: 3 PTS: 2 REF: 081209ge STA: G.G.71
TOP: Equations of Circles

521 ANS:

If $r = 5$, then $r^2 = 25$. $(x+3)^2 + (y-2)^2 = 25$

PTS: 2 REF: 011332ge STA: G.G.71 TOP: Equations of Circles

522 ANS: 3 PTS: 2 REF: 061306ge STA: G.G.71
TOP: Equations of Circles

523 ANS: 4 PTS: 2 REF: 081305ge STA: G.G.71
TOP: Equations of Circles

524 ANS: 1 PTS: 2 REF: 011423ge STA: G.G.71
TOP: Equations of Circles

525 ANS: 1

$\left(\frac{2+2}{2}, \frac{0+(-8)}{2}\right) = (2,-4)$ $\sqrt{(2-2)^2 + (-8-0)^2} = 8 = d$

$$4 = r$$

$$16 = r^2$$

PTS: 2 REF: 061428ge STA: G.G.71 TOP: Equations of Circles

526 ANS: 2 PTS: 2 REF: 011511ge STA: G.G.71
TOP: Equations of Circles
527 ANS: 2 PTS: 2 REF: 061524ge STA: G.G.71
TOP: Equations of Circles
528 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72
TOP: Equations of Circles
529 ANS: 4
The radius is 4. $r^2 = 16$.

PTS: 2 REF: 061014ge STA: G.G.72 TOP: Equations of Circles
530 ANS:
$(x+1)^2 + (y-2)^2 = 36$

PTS: 2 REF: 081034ge STA: G.G.72 TOP: Equations of Circles
531 ANS: 1 PTS: 2 REF: 061110ge STA: G.G.72
TOP: Equations of Circles
532 ANS:
$(x-5)^2 + (y+4)^2 = 36$

PTS: 2 REF: 081132ge STA: G.G.72 TOP: Equations of Circles
533 ANS: 1 PTS: 2 REF: 011220ge STA: G.G.72
TOP: Equations of Circles
534 ANS: 2 PTS: 2 REF: 081212ge STA: G.G.72
TOP: Equations of Circles
535 ANS: 4 PTS: 2 REF: 011323ge STA: G.G.72
TOP: Equations of Circles
536 ANS: 3 PTS: 2 REF: 061309ge STA: G.G.72
TOP: Equations of Circles
537 ANS: 3 PTS: 2 REF: 081312ge STA: G.G.72
TOP: Equations of Circles
538 ANS: 4 PTS: 2 REF: 011415ge STA: G.G.72
TOP: Equations of Circles
539 ANS: 1 PTS: 2 REF: 061408ge STA: G.G.72
TOP: Equations of Circles
540 ANS: 4 PTS: 2 REF: 081409ge STA: G.G.72
TOP: Equations of Circles
541 ANS: 3 PTS: 2 REF: 011514ge STA: G.G.72
TOP: Equations of Circles
542 ANS: 1 PTS: 2 REF: 061510ge STA: G.G.72
TOP: Equations of Circles
543 ANS: 2 PTS: 2 REF: 081520ge STA: G.G.72
TOP: Equations of Circles
544 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73
TOP: Equations of Circles
545 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles

546 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73
TOP: Equations of Circles
547 ANS: 1 PTS: 2 REF: 081009ge STA: G.G.73
TOP: Equations of Circles
548 ANS: 4 PTS: 2 REF: 061114ge STA: G.G.73
TOP: Equations of Circles
549 ANS: 2 PTS: 2 REF: 011203ge STA: G.G.73
TOP: Equations of Circles
550 ANS: 1 PTS: 2 REF: 061223ge STA: G.G.73
TOP: Equations of Circles
551 ANS: 4 PTS: 2 REF: 011318ge STA: G.G.73
TOP: Equations of Circles
552 ANS: 4 PTS: 2 REF: 061319ge STA: G.G.73
TOP: Equations of Circles
553 ANS:
center: $(3,-4)$; radius: $\sqrt{10}$

PTS: 2 REF: 081333ge STA: G.G.73 TOP: Equations of Circles
554 ANS: 4 PTS: 2 REF: 011403ge STA: G.G.73
TOP: Equations of Circles
555 ANS: 4 PTS: 2 REF: 011426ge STA: G.G.73
TOP: Equations of Circles
556 ANS: 4 PTS: 2 REF: 061422ge STA: G.G.73
TOP: Equations of Circles
557 ANS: 1
$r^2 = 48$

$r = \sqrt{48} = \sqrt{16} \cdot \sqrt{3} = 4\sqrt{3}$

PTS: 2 REF: 081412ge STA: G.G.73 TOP: Equations of Circles
558 ANS: 3
$r^2 = 50$

$r = \sqrt{50} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$

PTS: 2 REF: 061515ge STA: G.G.73 TOP: Equations of Circles
559 ANS: 3 PTS: 2 REF: 081502ge STA: G.G.73
TOP: Equations of Circles
560 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles
561 ANS: 2 PTS: 2 REF: 011020ge STA: G.G.74
TOP: Graphing Circles
562 ANS: 2 PTS: 2 REF: 011125ge STA: G.G.74
TOP: Graphing Circles
563 ANS: 3 PTS: 2 REF: 061220ge STA: G.G.74
TOP: Graphing Circles

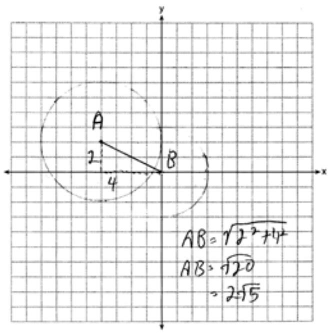
564 ANS: 1 PTS: 2 REF: 061325ge STA: G.G.74
TOP: Graphing Circles

565 ANS: 1 PTS: 2 REF: 081324ge STA: G.G.74
TOP: Graphing Circles

566 ANS: 2 PTS: 2 REF: 081425ge STA: G.G.74
TOP: Graphing Circles

567 ANS: 3 PTS: 2 REF: 011518ge STA: G.G.74
TOP: Graphing Circles

568 ANS:



PTS: 4 REF: 081537ge STA: G.G.74 TOP: Graphing Circles

569 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

570 ANS: 3

$$25 \times 9 \times 12 = 15^2 h$$

$$2700 = 15^2 h$$

$$12 = h$$

PTS: 2 REF: 061323ge STA: G.G.11 TOP: Volume

571 ANS: 1

If two prisms have equal heights and volume, the area of their bases is equal.

PTS: 2 REF: 081321ge STA: G.G.11 TOP: Volume

572 ANS:

$$5 \cdot 5 = 10w$$

$$25 = 10w$$

$$2.5 = w$$

PTS: 2 REF: 061432ge STA: G.G.11 TOP: Volume

573 ANS: 3

$720 = 5B$

$144 = B$

PTS: 2 REF: 081523ge STA: G.G.11 TOP: Volume

574 ANS: 1

$\frac{3x^2 + 18x + 24}{3(x+2)}$

$\frac{3(x^2 + 6x + 8)}{3(x+2)}$

$\frac{3(x+4)(x+2)}{3(x+2)}$

$x + 4$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume

575 ANS:

9.1. $(11)(8)h = 800$

$h \approx 9.1$

PTS: 2 REF: 061131ge STA: G.G.12 TOP: Volume

576 ANS: 3 PTS: 2 REF: 081123ge STA: G.G.12
TOP: Volume

577 ANS: 2 PTS: 2 REF: 011215ge STA: G.G.12
TOP: Volume

578 ANS:

$Bh = V$

$12h = 84$

$h = 7$

PTS: 2 REF: 011432ge STA: G.G.12 TOP: Volume

579 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

580 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

581 ANS: 1

$256 = \frac{1}{3}B \cdot 12$

$64 = B$

$8 = s$

PTS: 2 REF: 081428ge STA: G.G.13 TOP: Volume

582 ANS:

22.4. $V = \pi r^2 h$

$12566.4 = \pi r^2 \cdot 8$

$r^2 = \frac{12566.4}{8\pi}$

$r \approx 22.4$

PTS: 2 REF: fall0833ge STA: G.G.14 TOP: Volume and Lateral Area

583 ANS: 1

$V = \pi r^2 h$

$1000 = \pi r^2 \cdot 8$

$r^2 = \frac{1000}{8\pi}$

$r \approx 6.3$

PTS: 2 REF: 080926ge STA: G.G.14 TOP: Volume and Lateral Area

584 ANS: 3

$V = \pi r^2 h = \pi \cdot 6^2 \cdot 27 = 972\pi$

PTS: 2 REF: 011027ge STA: G.G.14 TOP: Volume and Lateral Area

585 ANS: 4

$L = 2\pi rh = 2\pi \cdot 5 \cdot 11 \approx 345.6$

PTS: 2 REF: 061006ge STA: G.G.14 TOP: Volume and Lateral Area

586 ANS: 2
$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 = 540\pi$

PTS: 2 REF: 011117ge STA: G.G.14 TOP: Volume and Lateral Area

587 ANS:

$$\begin{aligned} V &= \pi r^2 h \\ 600\pi &= \pi r^2 \cdot 12 \\ 50 &= r^2 \\ \sqrt{25}\sqrt{2} &= r \\ 5\sqrt{2} &= r \end{aligned}$$

. $L = 2\pi rh = 2\pi \cdot 5\sqrt{2} \cdot 12 \approx 533.1$

PTS: 4 REF: 011236ge STA: G.G.14 TOP: Volume and Lateral Area

588 ANS:
$L = 2\pi rh = 2\pi \cdot 12 \cdot 22 \approx 1659$. $\frac{1659}{600} \approx 2.8$. 3 cans are needed.

PTS: 2 REF: 061233ge STA: G.G.14 TOP: Volume and Lateral Area

589 ANS:
$V = \pi r^2 h = \pi(5)^2 \cdot 7 = 175\pi$

PTS: 2 REF: 081231ge STA: G.G.14 TOP: Volume and Lateral Area

590 ANS:
$L = 2\pi rh = 2\pi \cdot 3 \cdot 5 \approx 94.25$. $V = \pi r^2 h = \pi(3)^2(5) \approx 141.37$

PTS: 4 REF: 011335ge STA: G.G.14 TOP: Volume and Lateral Area

591 ANS:
$L = 2\pi rh = 2\pi \cdot 3 \cdot 7 = 42\pi$

PTS: 2 REF: 061329ge STA: G.G.14 TOP: Volume and Lateral Area

592 ANS: 2
$18\pi \cdot 42 \approx 2375$

PTS: 2 REF: 011418ge STA: G.G.14 TOP: Volume and Lateral Area

593 ANS: 3
$L = 2\pi rh = 2\pi \cdot \frac{6}{2} \cdot 15 = 90\pi$

PTS: 2 REF: 061405ge STA: G.G.14 TOP: Volume and Lateral Area

594 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

595 ANS:
375π $L = \pi r l = \pi(15)(25) = 375\pi$

PTS: 2 REF: 081030ge STA: G.G.15 TOP: Lateral Area

596 ANS: 3
$120\pi = \pi(12)(l)$

$10 = l$

PTS: 2 REF: 081314ge STA: G.G.15 TOP: Volume and Lateral Area

597 ANS:
$l = \sqrt{10^2 + 3^2} = \sqrt{109}$ $L = \pi r l = \pi(3)(\sqrt{109}) \approx 98.4$

PTS: 4 REF: 081436ge STA: G.G.15 TOP: Volume and Lateral Area

598 ANS:
$h = \sqrt{5^2 - 3^2} = 4$ $V = \frac{1}{3}\pi \cdot 3^2 \cdot 4 = 12\pi$ $V = \pi \cdot 4^2 \cdot 6 = 96\pi$ $\frac{96\pi}{12\pi} = 8$

PTS: 4 REF: 011537ge STA: G.G.15 TOP: Volume and Lateral Area

599 ANS:
$l = \sqrt{12^2 + 5^2} = \sqrt{169} = 13$ $L = \pi r l = \pi(5)(13) = 65\pi$

PTS: 2 REF: 061531ge STA: G.G.15 TOP: Volume and Lateral Area

600 ANS:
$V = \frac{1}{3}\pi(3^2)(8) = 24\pi$

PTS: 2 REF: 081530ge STA: G.G.15 TOP: Volume and Lateral Area

601 ANS:
452. $SA = 4\pi r^2 = 4\pi \cdot 6^2 = 144\pi \approx 452$

PTS: 2 REF: 061029ge STA: G.G.16 TOP: Volume and Surface Area

602 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

603 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

604 ANS:
$V = \frac{4}{3}\pi \cdot 9^3 = 972\pi$

PTS: 2 REF: 081131ge STA: G.G.16 TOP: Volume and Surface Area
605 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
606 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
607 ANS: 1

$$
\begin{aligned}
V &= \frac{4}{3}\pi r^3 \\
44.6022 &= \frac{4}{3}\pi r^3 \\
10.648 &\approx r^3 \\
2.2 &\approx r
\end{aligned}
$$

PTS: 2 REF: 061317ge STA: G.G.16 TOP: Volume and Surface Area
608 ANS:
$SA = 4\pi r^2 = 4\pi \cdot 2.5^2 = 25\pi \approx 78.54$

PTS: 2 REF: 011429ge STA: G.G.16 TOP: Volume and Surface Area
609 ANS: 3

$$
\begin{aligned}
144\pi &= 4\pi r^2 \\
36 &= r^2 \\
6 &= r
\end{aligned}
$$

PTS: 2 REF: 061415ge STA: G.G.16 TOP: Volume and Surface Area
610 ANS: 3
$V = \frac{2}{3}\pi \left(\frac{12}{2}\right)^3 \approx 905$

PTS: 2 REF: 061502ge STA: G.G.16 TOP: Volume and Surface Area

611 ANS: 4
Corresponding angles of similar triangles are congruent.

PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

612 ANS:
20. $5x + 10 = 4x + 30$

$x = 20$

PTS: 2 REF: 060934ge STA: G.G.45 TOP: Similarity
KEY: basic

613 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

614 ANS: 4
$180 - (50 + 30) = 100$

PTS: 2 REF: 081006ge STA: G.G.45 TOP: Similarity
KEY: basic

615 ANS: 4 PTS: 2 REF: 081023ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

616 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

617 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

618 ANS: 3 PTS: 2 REF: 061224ge STA: G.G.45
TOP: Similarity KEY: basic

619 ANS: 4 PTS: 2 REF: 081216ge STA: G.G.45
TOP: Similarity KEY: basic

620 ANS: 2

Perimeter of $\triangle DEF$ is $5+8+11=24$. $\frac{5}{24}=\frac{x}{60}$

$$24x = 300$$

$$x = 12.5$$

PTS: 2 REF: 011307ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

621 ANS:

$x^2-8x=5x+30$. $\text{m}\angle C=4(15)-5=55$

$$x^2-13x-30=0$$

$$(x-15)(x+2)=0$$

$$x=15$$

PTS: 4 REF: 061337ge STA: G.G.45 TOP: Similarity
KEY: basic

622 ANS: 3

$$\frac{15}{18}=\frac{5}{6}$$

PTS: 2 REF: 081317ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

623 ANS:

$$\left(\frac{3}{2}\right)^2=\frac{27}{A}$$

$$\frac{9}{4}=\frac{27}{A}$$

$$9A=108$$

$$A=12$$

PTS: 2 REF: 061434ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

624 ANS: 1 PTS: 2 REF: 061517ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

625 ANS: 2

$$45\cdot\frac{8}{20}=18$$

PTS: 2 REF: 081511ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

626 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

627 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

628 ANS: 4
Let $\overline{AD} = x$. $36x = 12^2$

$x = 4$

PTS: 2 REF: 080922ge STA: G.G.47 TOP: Similarity
KEY: leg

629 ANS:
2.4. $5a = 4^2$ $5b = 3^2$ $h^2 = ab$

$a = 3.2$ $b = 1.8$ $h^2 = 3.2 \cdot 1.8$

$h = \sqrt{5.76} = 2.4$

PTS: 4 REF: 081037ge STA: G.G.47 TOP: Similarity
KEY: leg

630 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

631 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

632 ANS: 4

$x \cdot 4x = 6^2$. $PQ = 4x + x = 5x = 5(3) = 15$

$4x^2 = 36$

$x = 3$

PTS: 2 REF: 011227ge STA: G.G.47 TOP: Similarity
KEY: altitude

633 ANS: 1

$x^2 = 3 \times 12$

$x = 6$

PTS: 2 REF: 011308ge STA: G.G.47 TOP: Similarity
KEY: altitude

634 ANS: 3

$x^2 = 3 \times 12$. $\sqrt{6^2 + 3^2} = \sqrt{45} = \sqrt{9}\sqrt{5} = 3\sqrt{5}$

$x = 6$

PTS: 2 REF: 061327ge STA: G.G.47 TOP: Similarity
KEY: leg

635 ANS: 3

$x^2 = 2(2+10)$

$x^2 = 24$

$x = \sqrt{24} = \sqrt{4}\sqrt{6} = 2\sqrt{6}$

PTS: 2 REF: 081326ge STA: G.G.47 TOP: Similarity
KEY: leg

636 ANS:

$$4x \cdot x = 6^2$$
$$4x^2 = 36$$
$$x^2 = 9$$
$$x = 3$$
$$\overline{BD} = 4(3) = 12$$

PTS: 4 REF: 011437ge STA: G.G.47 TOP: Similarity
KEY: altitude

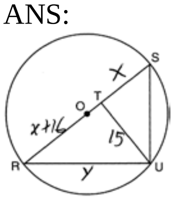
637 ANS:

$$x^2 = 8(10+8)$$
$$x^2 = 144$$
$$x = 12$$

PTS: 2 REF: 061431ge STA: G.G.47 TOP: Similarity
KEY: leg

638 ANS: 3 PTS: 2 REF: 081410ge STA: G.G.47
TOP: Similarity KEY: altitude

639 ANS:



$$x(x+16) = 15^2 \quad 25 \cdot 34 = y^2$$
$$x^2 + 16x - 225 = 0 \quad 5\sqrt{34} = y$$
$$(x+25)(x-9) = 0$$
$$x = 9$$

PTS: 6 REF: 011538ge STA: G.G.47 TOP: Similarity
KEY: leg

640 ANS: 3

$$x^2 = 8 \times 18$$
$$x^2 = 144$$
$$x = 12$$

PTS: 2 REF: 061506ge STA: G.G.47 TOP: Similarity
KEY: altitude

641 ANS: 3

$$x^2 = 4 \cdot 7$$

$$x = \sqrt{4} \cdot \sqrt{7}$$

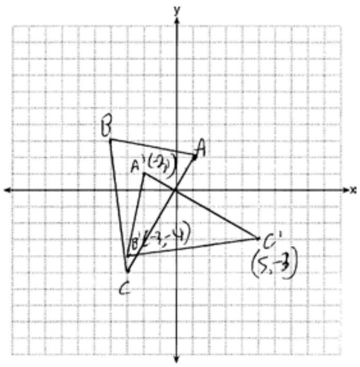
$$x = 2\sqrt{7}$$

PTS: 2 REF: 081528ge STA: G.G.47 TOP: Similarity
KEY: leg

642 ANS:
$R'(-3,-2)$, $S'(-4,4)$, and $T'(2,2)$.

PTS: 2 REF: 011232ge STA: G.G.54 TOP: Rotations

643 ANS:



$A'(-2,1)$, $B'(-3,-4)$, and $C'(5,-3)$

PTS: 2 REF: 081230ge STA: G.G.54 TOP: Rotations

644 ANS: 4
$(x,y) \to (-x,-y)$

PTS: 2 REF: 061304ge STA: G.G.54 TOP: Rotations

645 ANS: 4 PTS: 2 REF: 011421ge STA: G.G.54
TOP: Rotations

646 ANS:

$$(x,y) \to (-y,x)$$

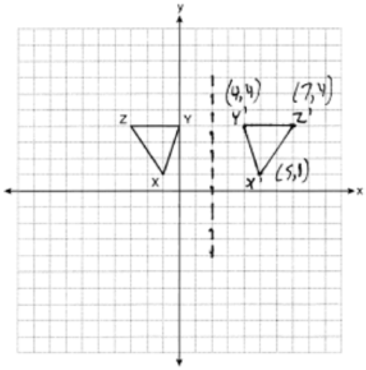
$$B(5,1) \to B'(-1,5)$$

$$C(-3,-2) \to C'(2,-3)$$

PTS: 2 REF: 061429ge STA: G.G.54 TOP: Rotations

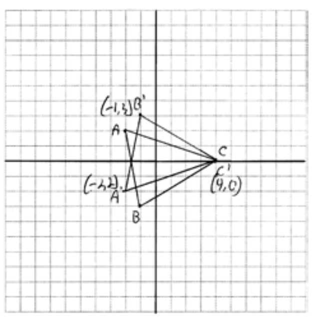
647 ANS: 3 PTS: 2 REF: 060905ge STA: G.G.54
TOP: Reflections KEY: basic

648 ANS:



PTS: 2 REF: 061032ge STA: G.G.54 TOP: Reflections
KEY: grids

649 ANS:

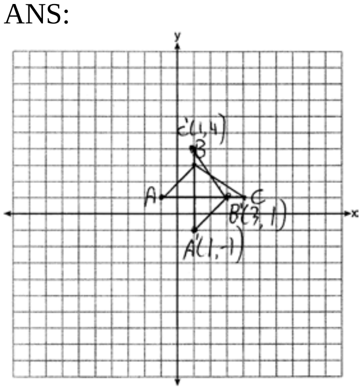


PTS: 2 REF: 011130ge STA: G.G.54 TOP: Reflections
KEY: grids

650 ANS: 2 PTS: 2 REF: 081108ge STA: G.G.54
TOP: Reflections KEY: basic

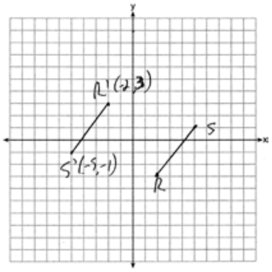
651 ANS: 1 PTS: 2 REF: 081113ge STA: G.G.54
TOP: Reflections KEY: basic

652 ANS:



PTS: 2 REF: 061530ge STA: G.G.54 TOP: Reflections
KEY: grids

653 ANS:



PTS: 2 REF: 081529ge STA: G.G.54 TOP: Reflections
KEY: grids

654 ANS: 1
$(x,y) \to (x+3, y+1)$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

655 ANS: 3
$-5+3=-2 \qquad 2+-4=-2$

PTS: 2 REF: 011107ge STA: G.G.54 TOP: Translations

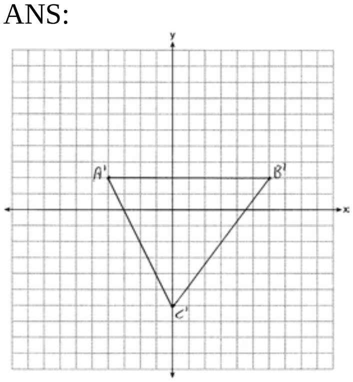
656 ANS:
$T_{-2,1} \quad A(0,1)$

PTS: 2 REF: 081431ge STA: G.G.54 TOP: Translations

657 ANS:
$A'(2,2), B'(3,0), C(1,-1)$

PTS: 2 REF: 081329ge STA: G.G.58 TOP: Dilations

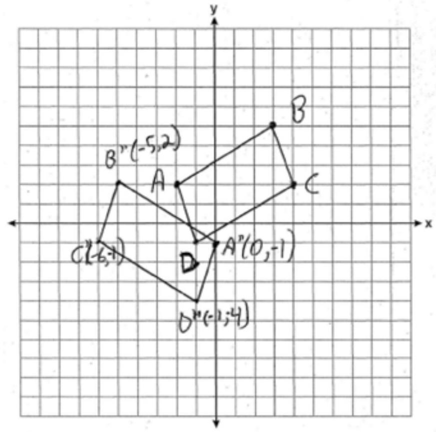
658 ANS:



PTS: 2 REF: 081429ge STA: G.G.58 TOP: Dilations

659 ANS: 3 PTS: 2 REF: 011524ge STA: G.G.58
TOP: Dilations

660 ANS:



PTS: 4 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

661 ANS: 1
$A'(2,4)$

PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

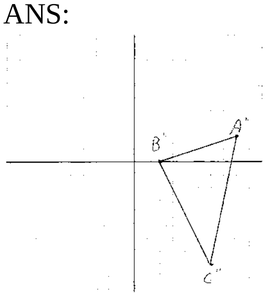
662 ANS: 3
$(3,-2) \rightarrow (2,3) \rightarrow (8,12)$

PTS: 2 REF: 011126ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

663 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

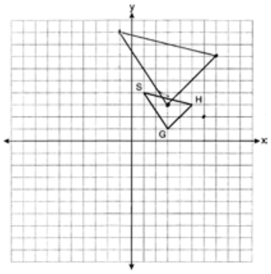
664 ANS:



$A''(8,2)$, $B''(2,0)$, $C''(6,-8)$

PTS: 4 REF: 081036ge STA: G.G.58 TOP: Compositions of Transformations

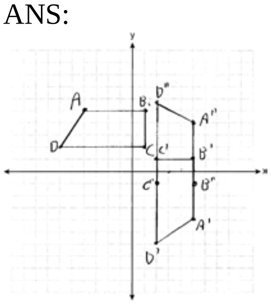
665 ANS:



$G''(3,3), H''(7,7), S''(-1,9)$

PTS: 4 REF: 081136ge STA: G.G.58 TOP: Compositions of Transformations

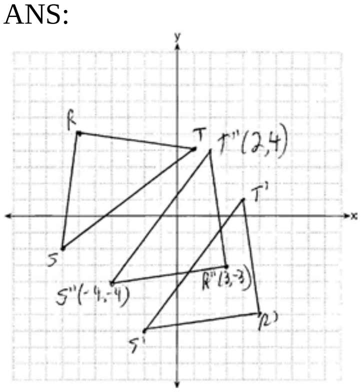
666 ANS:



$A'(5,-4)$, $B'(5,1)$, $C'(2,1)$, $D'(2,-6)$; $A''(5,4)$, $B''(5,-1)$, $C''(2,-1)$, $D''(2,6)$

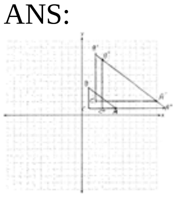
PTS: 4 REF: 061236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

667 ANS:



PTS: 4 REF: 081236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

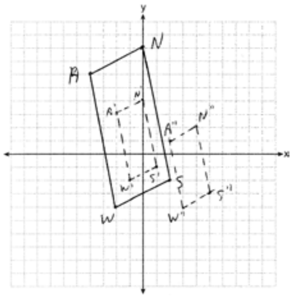
668 ANS:



$A''(11,1)$, $B''(3,7)$, $C''(3,1)$

PTS: 4 REF: 011336ge STA: G.G.58 TOP: Compositions of Transformations

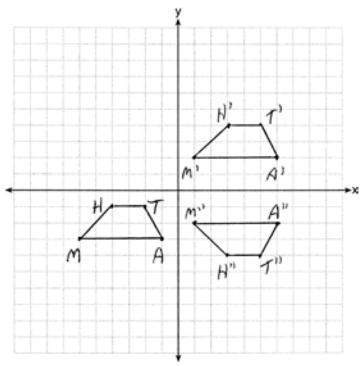
669 ANS:



$S''(5,-3)$, $W''(3,-4)$, $A''(2,1)$, and $N''(4,2)$

PTS: 4 REF: 061335ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

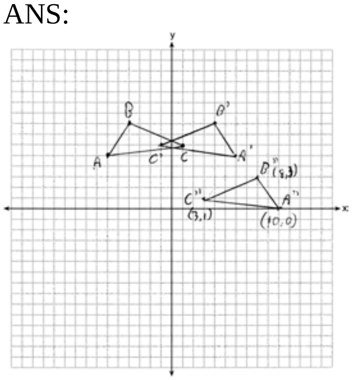
670 ANS:



$M''(1,-2), A''(6,-2), T''(5,-4), H''(3,-4)$

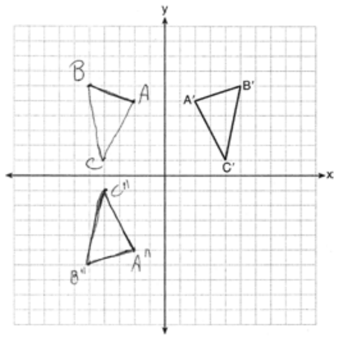
PTS: 4 REF: 081336ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

671 ANS:



PTS: 3 REF: 011436ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

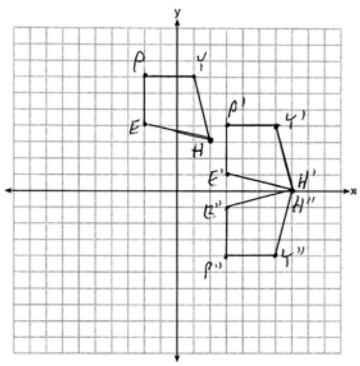
672 ANS:



$r_{x\text{-axis}}$

PTS: 4 REF: 061435ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

673 ANS:

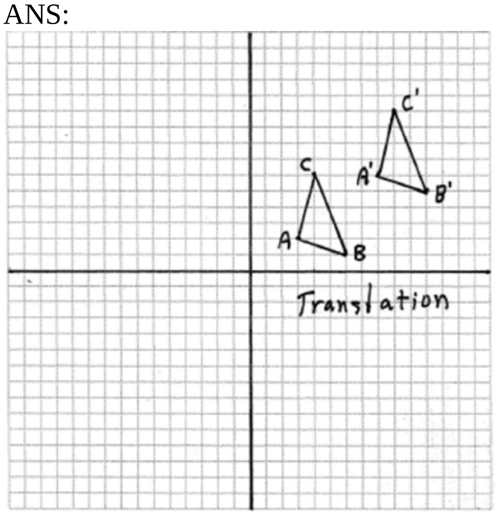


$$H'(7,0), Y'(6,4), P'(3,4), E'(3,1)$$

$$H''(7,0), Y''(6,-4), P''(3,-4), E''(3,-1)$$

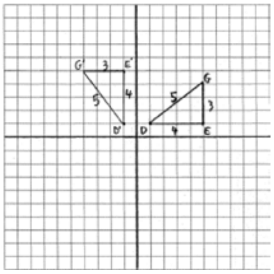
PTS: 4 REF: 011535ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

674 ANS:



PTS: 2 REF: fall0830ge STA: G.G.55 TOP: Properties of Transformations

675 ANS:



$D'(-1,1), E'(-1,5), G'(-4,5)$

PTS: 4 REF: 080937ge STA: G.G.55 TOP: Properties of Transformations

676 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

677 ANS: 1 PTS: 2 REF: 061005ge STA: G.G.55
TOP: Properties of Transformations

678 ANS: 1 PTS: 2 REF: 011102ge STA: G.G.55
TOP: Properties of Transformations

679 ANS:
Yes. A reflection is an isometry.

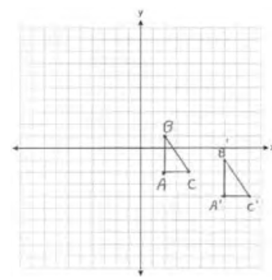
PTS: 2 REF: 061132ge STA: G.G.55 TOP: Properties of Transformations

680 ANS: 3 PTS: 2 REF: 081104ge STA: G.G.55
TOP: Properties of Transformations

681 ANS: 2 PTS: 2 REF: 011211ge STA: G.G.55
TOP: Properties of Transformations

682 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

683 ANS: 2 PTS: 2 REF: 081202ge STA: G.G.55
TOP: Properties of Transformations

684 ANS:
Distance is preserved after the reflection. $2x + 13 = 9x - 8$

$$21 = 7x$$

$$3 = x$$

PTS: 2 REF: 011329ge STA: G.G.55 TOP: Properties of Transformations

685 ANS: 1 PTS: 2 REF: 061307ge STA: G.G.55
TOP: Properties of Transformations

686 ANS: 4
Distance is preserved after a rotation.

PTS: 2 REF: 081304ge STA: G.G.55 TOP: Properties of Transformations
687 ANS: 3 PTS: 2 REF: 061421ge STA: G.G.55
TOP: Properties of Transformations
688 ANS: 4 PTS: 2 REF: 081408ge STA: G.G.55
TOP: Properties of Transformations
689 ANS: 3 PTS: 2 REF: 011503ge STA: G.G.55
TOP: Properties of Transformations
690 ANS: 2 PTS: 2 REF: 061509ge STA: G.G.55
TOP: Properties of Transformations
691 ANS: 2 PTS: 2 REF: 081515ge STA: G.G.55
TOP: Properties of Transformations
692 ANS: 3 PTS: 2 REF: 081021ge STA: G.G.57
TOP: Properties of Transformations
693 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
694 ANS: 2 PTS: 2 REF: 061126ge STA: G.G.59
TOP: Properties of Transformations
695 ANS: 2 PTS: 2 REF: 061201ge STA: G.G.59
TOP: Properties of Transformations
696 ANS: 3 PTS: 2 REF: 081204ge STA: G.G.59
TOP: Properties of Transformations
697 ANS: 1 PTS: 2 REF: 011405ge STA: G.G.59
TOP: Properties of Transformations
698 ANS: 4 PTS: 2 REF: 081506ge STA: G.G.59
TOP: Properties of Transformations
699 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations
700 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations
701 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Identifying Transformations
702 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations
703 ANS: 4 PTS: 2 REF: 061018ge STA: G.G.56
TOP: Identifying Transformations
704 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.56
TOP: Identifying Transformations
705 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
TOP: Identifying Transformations
706 ANS: 2 PTS: 2 REF: 061227ge STA: G.G.56
TOP: Identifying Transformations

707 ANS: 3 PTS: 2 REF: 011427ge STA: G.G.56
TOP: Identifying Transformations

708 ANS: 3 PTS: 2 REF: 081405ge STA: G.G.56
TOP: Identifying Transformations

709 ANS: 4
(2) rotation is also a correct response

PTS: 2 REF: 011527ge STA: G.G.56 TOP: Identifying Transformations

710 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations

711 ANS: 2
A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations

712 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations

713 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations

714 ANS: 1
Translations and reflections do not affect distance.

PTS: 2 REF: 080908ge STA: G.G.61
TOP: Analytical Representations of Transformations

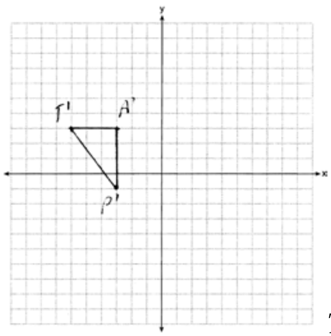
715 ANS: 3 PTS: 2 REF: 061501ge STA: G.G.61
TOP: Analytical Representations of Transformations

716 ANS: 1
$(2,-7) \rightarrow (2-3,-7+5) = (-1,-2)$

PTS: 2 REF: 061504ge STA: G.G.61
TOP: Analytical Representations of Transformations

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

717 ANS:



$T'(-6,3), A'(-3,3), P'(-3,-1)$

PTS: 2 REF: 061229ge STA: G.G.61
TOP: Analytical Representations of Transformations

718 ANS: 3 PTS: 2 REF: 011304ge STA: G.G.61
TOP: Analytical Representations of Transformations

719 ANS: 2 PTS: 2 REF: 081504ge STA: G.G.61
TOP: Analytical Representations of Transformations

720 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

721 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

722 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations

723 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations

724 ANS:
The medians of a triangle are not concurrent. False.

PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations

725 ANS: 1 PTS: 2 REF: 011213ge STA: G.G.24
TOP: Negations

726 ANS: 2 PTS: 2 REF: 061202ge STA: G.G.24
TOP: Negations

727 ANS:
2 is not a prime number, false.

PTS: 2 REF: 081229ge STA: G.G.24 TOP: Negations

728 ANS: 1 PTS: 2 REF: 011303ge STA: G.G.24
TOP: Statements

729 ANS: 2 PTS: 2 REF: 081301ge STA: G.G.24
TOP: Statements

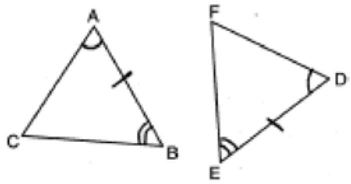
730 ANS: 1 PTS: 2 REF: 081303ge STA: G.G.24
TOP: Negations
731 ANS: 4 PTS: 2 REF: 061412ge STA: G.G.24
TOP: Negations
732 ANS: 4 PTS: 2 REF: 081417ge STA: G.G.24
TOP: Statements
733 ANS: 3 PTS: 2 REF: 011506ge STA: G.G.24
TOP: Negations
734 ANS:
True. The first statement is true and the second statement 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
735 ANS: 4 PTS: 2 REF: 011118ge STA: G.G.25
TOP: Compound Statements KEY: general
736 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction
737 ANS: 4 PTS: 2 REF: 061423ge STA: G.G.25
TOP: Compound Statements KEY: conditional
738 ANS: 1 PTS: 2 REF: 081421ge STA: G.G.25
TOP: Compound Statements KEY: general
739 ANS: 4 PTS: 2 REF: 081505ge STA: G.G.25
TOP: Compound Statements KEY: disjunction
740 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
741 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements
742 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements
743 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse and Biconditional
744 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26
TOP: Contrapositive
745 ANS: 1 PTS: 2 REF: 011320ge STA: G.G.26
TOP: Conditional Statements
746 ANS: 1 PTS: 2 REF: 061314ge STA: G.G.26
TOP: Converse and Biconditional
747 ANS: 4 PTS: 2 REF: 081318ge STA: G.G.26
TOP: Converse and Biconditional
748 ANS: 2 PTS: 2 REF: 011517ge STA: G.G.26
TOP: Contrapositive
749 ANS: 3 PTS: 2 REF: 061526ge STA: G.G.26
TOP: Inverse

750 ANS: 1 PTS: 2 REF: 081513ge STA: G.G.26
TOP: Contrapositive

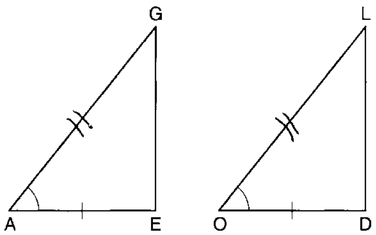
751 ANS: 3



PTS: 2 REF: 060902ge STA: G.G.28 TOP: Triangle Congruency

752 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency

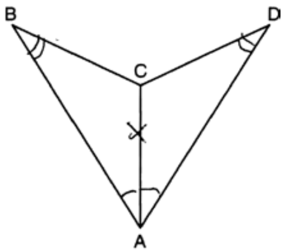
753 ANS: 2



PTS: 2 REF: 081007ge STA: G.G.28 TOP: Triangle Congruency

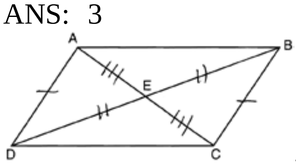
754 ANS: 1 PTS: 2 REF: 011122ge STA: G.G.28
TOP: Triangle Congruency

755 ANS: 4



PTS: 2 REF: 081114ge STA: G.G.28 TOP: Triangle Congruency

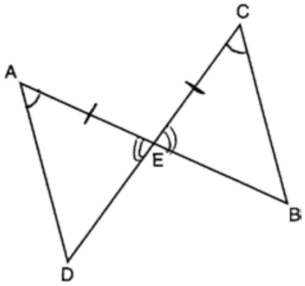
756 ANS: 3



. 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

757 ANS: 1

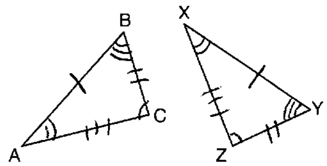


PTS: 2 REF: 081210ge STA: G.G.28 TOP: Triangle Congruency

758 ANS: 1 PTS: 2 REF: 011412ge STA: G.G.28
TOP: Triangle Congruency

759 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29
TOP: Triangle Congruency

760 ANS: 4



PTS: 2 REF: 081001ge STA: G.G.29 TOP: Triangle Congruency

761 ANS: 3 PTS: 2 REF: 061102ge STA: G.G.29
TOP: Triangle Congruency

762 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency

763 ANS: 4 PTS: 2 REF: 011216ge STA: G.G.29
TOP: Triangle Congruency

764 ANS: 1 PTS: 2 REF: 011301ge STA: G.G.29
TOP: Triangle Congruency

765 ANS: 2
(1) is true because of vertical angles. (3) and (4) are true because CPCTC.

PTS: 2 REF: 061302ge STA: G.G.29 TOP: Triangle Congruency

766 ANS: 3 PTS: 2 REF: 081309ge STA: G.G.29
TOP: Triangle Congruency

767 ANS: 4 PTS: 2 REF: 061410ge STA: G.G.29
TOP: Triangle Congruency

768 ANS: 4 PTS: 2 REF: 081501ge STA: G.G.29
TOP: Triangle Congruency

769 ANS: 2

$$AC = BD$$

$$AC - BC = BD - BC$$

$$AB = CD$$

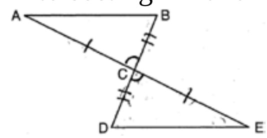
PTS: 2 REF: 061206ge STA: G.G.27 TOP: Line Proofs

770 ANS: 2 PTS: 2 REF: 061427ge STA: G.G.27
TOP: Line Proofs

771 ANS: 4 PTS: 2 REF: 011108ge STA: G.G.27
TOP: Angle Proofs

772 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

773 ANS:

$\angle B$ and $\angle C$ are right angles because perpendicular lines form right angles. $\angle B \cong \angle C$ because all right angles are congruent. $\angle AEB \cong \angle DEC$ because vertical angles are congruent. $\triangle ABE \cong \triangle DCE$ because of ASA. $\overline{AB} \cong \overline{DC}$ because CPCTC.

PTS: 4 REF: 061235ge STA: G.G.27 TOP: Triangle Proofs

774 ANS: 1

$$AB = CD$$
$$AB + BC = CD + BC$$
$$AC = BD$$

PTS: 2 REF: 081207ge STA: G.G.27 TOP: Triangle Proofs

775 ANS:

$\triangle MAH$, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are given. $\overline{MA} \cong \overline{AM}$ (reflexive property). $\triangle MAH$ is an isosceles triangle (definition of isosceles triangle). $\angle AMB \cong \angle MAT$ (isosceles triangle theorem). B is the midpoint of $\overline{MH}$ and T is the midpoint of $\overline{AH}$ (definition of median). $m\overline{MB} = \frac{1}{2} m\overline{MH}$ and $m\overline{AT} = \frac{1}{2} m\overline{AH}$ (definition of midpoint). $\overline{MB} \cong \overline{AT}$ (multiplication postulate). $\triangle MBA \cong \triangle ATM$ (SAS). $\angle MBA \cong \angle ATM$ (CPCTC).

PTS: 6 REF: 061338ge STA: G.G.27 TOP: Triangle Proofs

776 ANS:

$\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$ (Given). $\angle CBD \cong \angle ABD$ (Definition of angle bisector). $\overline{BD} \cong \overline{BD}$ (Reflexive property). $\angle CDB$ and $\angle ADB$ are right angles (Definition of perpendicular). $\angle CDB \cong \angle ADB$ (All right angles are congruent). $\triangle CDB \cong \triangle ADB$ (SAS). $\overline{AB} \cong \overline{CB}$ (CPCTC).

PTS: 4 REF: 081335ge STA: G.G.27 TOP: Triangle Proofs

777 ANS:

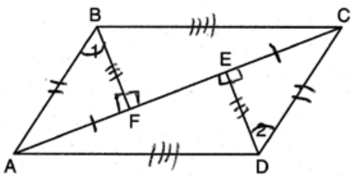
$\overline{MT}$ and $\overline{HA}$ intersect at B, $\overline{MA} \parallel \overline{HT}$, and $\overline{MT}$ bisects $\overline{HA}$ (Given). $\angle MBA \cong \angle TBH$ (Vertical Angles). $\angle A \cong \angle H$ (Alternate Interior Angles). $\overline{BH} \cong \overline{BA}$ (The bisection of a line segment creates two congruent segments). $\triangle MAB \cong \triangle THB$ (ASA). $\overline{MA} \cong \overline{HT}$ (CPCTC).

PTS: 4 REF: 081435ge STA: G.G.27 TOP: Triangle Proofs

778 ANS:
$\overline{BE}$ and $\overline{AD}$ intersect at point C, $\overline{BC} \cong \overline{EC}$, $\overline{AC} \cong \overline{DC}$, $\overline{AB}$ and $\overline{DE}$ are drawn (Given). $\angle BCA \cong \angle ECD$ (Vertical Angles). $\triangle ABC \cong \triangle DEC$ (SAS).

PTS: 2 REF: 011529ge STA: G.G.27 TOP: Triangle Proofs

779 ANS:



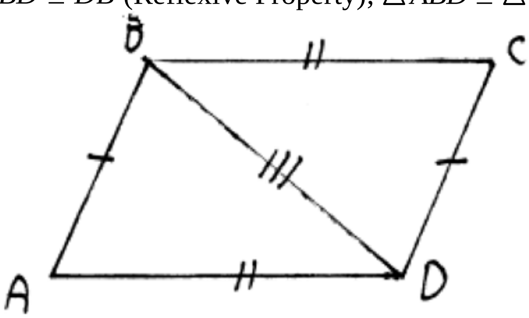
$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Line Segment Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); $ABCD$ is a parallelogram (opposite sides of quadrilateral $ABCD$ are congruent)

PTS: 6 REF: 080938ge STA: G.G.27 TOP: Quadrilateral Proofs

780 ANS:
$\overline{JK} \cong \overline{LM}$ because opposite sides of a parallelogram are congruent. $\overline{LM} \cong \overline{LN}$ because of the Isosceles Triangle Theorem. $\overline{LM} \cong \overline{JM}$ because of the transitive property. $JKLM$ is a rhombus because all sides are congruent.

PTS: 4 REF: 011036ge STA: G.G.27 TOP: Quadrilateral Proofs

781 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

782 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

783 ANS: 3 PTS: 2 REF: 081208ge STA: G.G.27
TOP: Quadrilateral Proofs

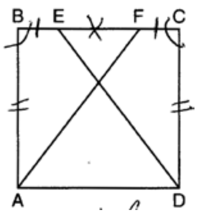
784 ANS:

Rectangle $ABCD$ with points E and F on side $\overline{AB}$, segments CE and DF intersect at G, and $\angle ADG \cong \angle BCE$ are given. $\overline{AD} \cong \overline{BC}$ because opposite sides of a rectangle are congruent. $\angle A$ and $\angle B$ are right angles and congruent because all angles of a rectangle are right and congruent. $\triangle ADF \cong \triangle BCE$ by ASA. $\overline{AF} \cong \overline{BE}$ per CPCTC. $\overline{EF} \cong \overline{FE}$ under the Reflexive Property. $\overline{AF} - \overline{EF} \cong \overline{BE} - \overline{FE}$ using the Subtraction Property of Segments. $\overline{AE} \cong \overline{BF}$ because of the Definition of Segments.

PTS: 6 REF: 011338ge STA: G.G.27 TOP: Quadrilateral Proofs

785 ANS: 2 PTS: 2 REF: 011411ge STA: G.G.27 TOP: Quadrilateral Proofs

786 ANS:

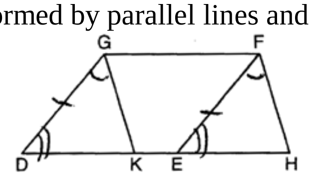


Square $ABCD$; E and F are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$; $\overline{AF}$ and $\overline{DE}$ drawn (Given). $\overline{AB} \cong \overline{CD}$ (All sides of a square are congruent). $\angle ABF \cong \angle DCE$ (All angles of a square are equiangular). $\overline{EF} \cong \overline{FE}$ (Reflexive property). $\overline{BE} + \overline{EF} \cong \overline{FC} + \overline{FE}$ (Additive property of line segments). $\overline{BF} \cong \overline{CE}$ (Angle addition). $\triangle ABF \cong \triangle DCE$ (SAS). $\overline{AF} \cong \overline{DE}$ (CPCTC).

PTS: 6 REF: 061538ge STA: G.G.27 TOP: Quadrilateral Proofs

787 ANS:

Parallelogram $DEFG$, K and H are points on $\overrightarrow{DE}$ such that $\angle DGK \cong \angle EFH$ and $\overline{GK}$ and $\overline{FH}$ are drawn (given). $\overline{DG} \cong \overline{EF}$ (opposite sides of a parallelogram are congruent). $\overline{DG} \parallel \overline{EF}$ (opposite sides of a parallelogram are parallel). $\angle D \cong \angle FEH$ (corresponding angles formed by parallel lines and a transversal are congruent). $\triangle DGK \cong \triangle EFH$ (ASA). $\overline{DK} \cong \overline{EH}$ (CPCTC).



PTS: 6 REF: 081538ge STA: G.G.27 TOP: Quadrilateral Proofs

788 ANS:

Because $\overline{AB} \parallel \overline{DC}$, $\overset{\frown}{AD} \cong \overset{\frown}{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\angle DAC \cong \angle DBC$ because inscribed angles that intercept the same arc are congruent. Therefore, $\triangle ACD \cong \triangle BDC$ because of AAS.

PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

789 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

790 ANS:
2. The diameter of a circle is $\perp$ to a tangent at the point of tangency. 4. An angle inscribed in a semicircle is a right angle. 5. All right angles are congruent. 7. AA. 8. Corresponding sides of congruent triangles are in proportion. 9. The product of the means equals the product of the extremes.

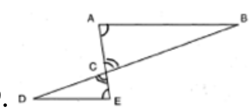
PTS: 6 REF: 011438ge STA: G.G.27 TOP: Circle Proofs

791 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

792 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

793 ANS: 4 PTS: 2 REF: 011019ge STA: G.G.44
TOP: Similarity Proofs

794 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

795 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

796 ANS: 3 PTS: 2 REF: 011209ge STA: G.G.44
TOP: Similarity Proofs

797 ANS: 2 PTS: 2 REF: 061324ge STA: G.G.44
TOP: Similarity Proofs

798 ANS: 4 PTS: 2 REF: 011528ge STA: G.G.44
TOP: Similarity Proofs