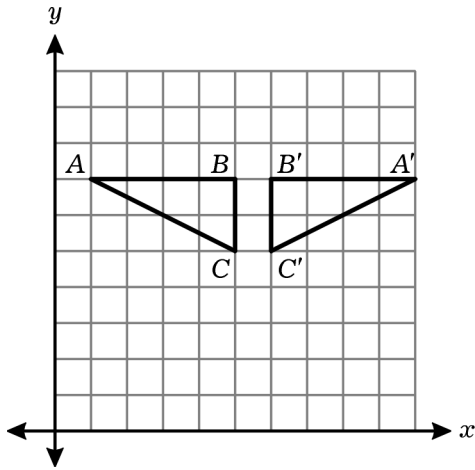


Name: _____

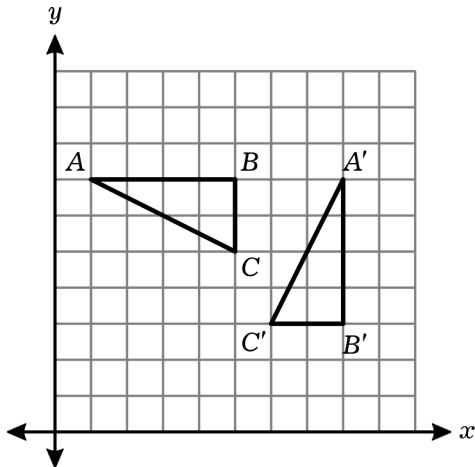
Date: _____

1. Triangle $A'B'C'$ is an image of the other triangle. What kind of transformation is shown?



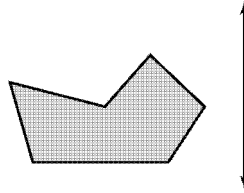
- A. translation B. reflection
C. dilation D. rotation

2. Triangle $A'B'C'$ is an image of the other triangle. What kind of transformation is shown?

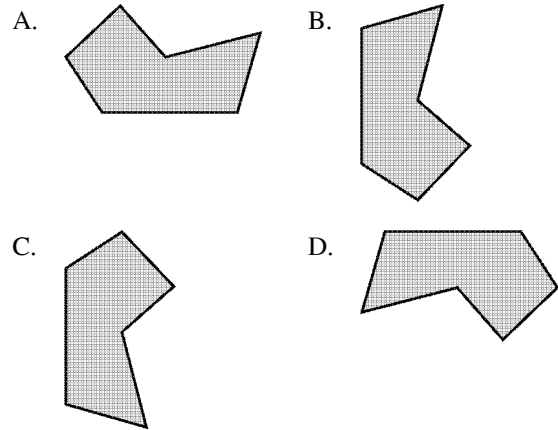


- A. translation B. reflection
C. dilation D. rotation

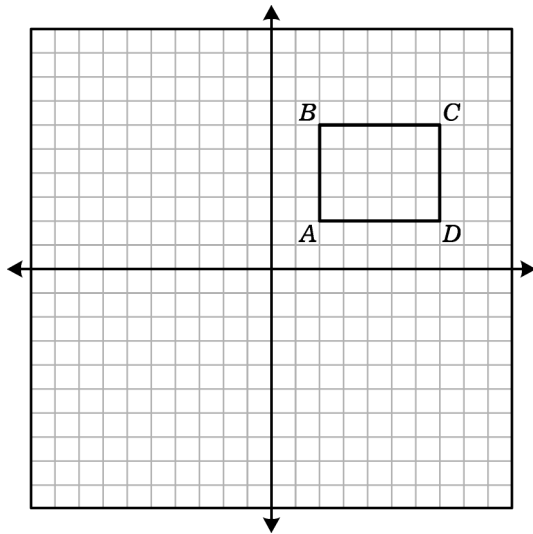
3. The following figure appears in a math workbook. Students are asked to reflect the polygon across the line, then rotate it 90° clockwise.



Which figure shows the result of the two transformations?



4.



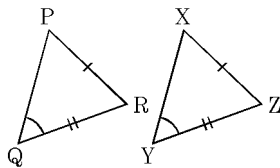
Using the coordinate plane, which of the following statements would result in figure $ABCD$ being in Quadrant IV?

- I. Figure $ABCD$ is reflected across the x -axis.
- II. Figure $ABCD$ is reflected across the y -axis.
- III. Figure $ABCD$ is translated 4 units to the left and 2 units down.
- IV. Figure $ABCD$ is rotated 90° about point B .

- A. I only B. II only
C. III only D. IV only

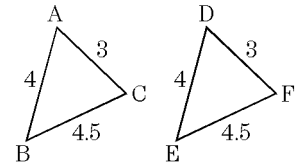
5. State the congruence relation for $\triangle XYZ$ and $\triangle PQR$.

- A. ASA
B. SSA
C. SAS
D. not necessarily congruent



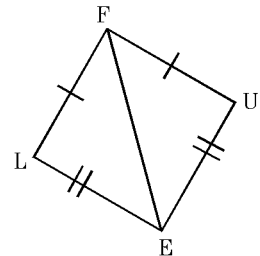
6. State the congruence relation for $\triangle ABC$ and $\triangle DEF$.

- A. SSS
B. SSA
C. AAA
D. SAS



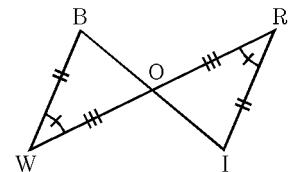
7. State the congruence relation for $\triangle FLE$ and $\triangle FUE$.

- A. ASA
B. AAA
C. SSA
D. SSS



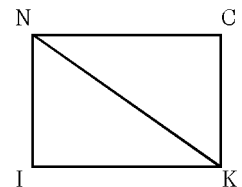
8. State the congruence relation for $\triangle BWO$ and $\triangle IRO$. Use only the markings in the diagram.

- A. AAA
B. SSA
C. SAS
D. not necessarily congruent



9. In the figure, $IN = CK$ and $\overline{IK} \parallel \overline{NC}$. What congruence statement proves $\triangle KNI \cong \triangle NKC$?

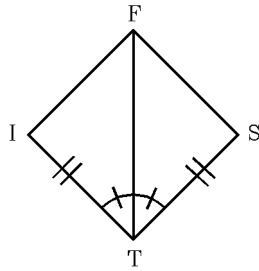
- A. SSS
B. SAS
C. SSA
D. not necessarily congruent



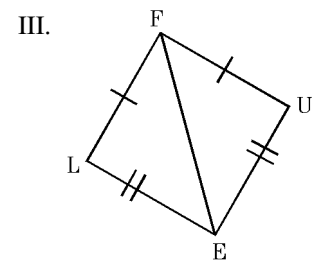
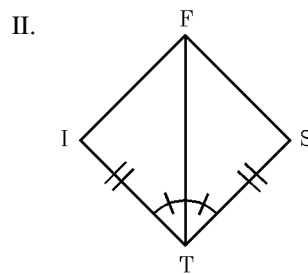
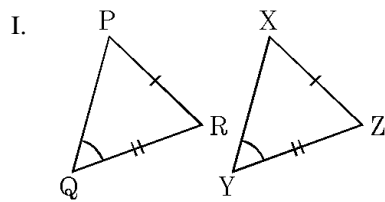
10. In the figure, $IT = ST$ and $m\angle FTI = m\angle FTS$. Complete the statement.

$\triangle FTI \cong \triangle$ _____

- A. FST B. STF
C. TSF D. FTS

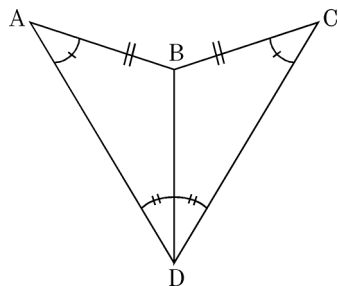


11. Which diagrams show that the two triangles *must* be congruent?



- A. I only B. II only C. I and II only D. II and III only

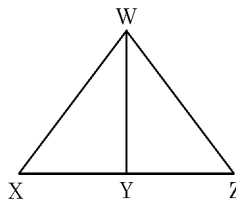
12. For the given diagram which of the following is true?



- A. $\triangle ABD \cong \triangle CBD$ by SAS and $AD = CD$
 B. $\triangle BAD \cong \triangle DBC$ by ASA and $AD = CD$
 C. $\triangle DAB \cong \triangle DCB$ by SSA and $AB = BC$
 D. $\triangle ABD \cong \triangle DBC$ by SAS and $AD = CD$

13. Given: \overline{WY} is the angle bisector of $\angle XWZ$
 $m\angle XYW = m\angle ZYW$

Prove: $\triangle WXY \cong \triangle WZY$



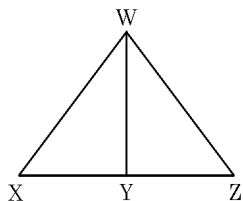
statement	reason
\overline{WY} is the \angle bisector of $\angle XWZ$	(1)
$m\angle XWY = m\angle ZWY$	(2)
$WY = WY$	(3)
$m\angle XYW = m\angle ZYW$	(4)
$\triangle WXY \cong \triangle WZY$	(5)

In the above proof, what is reason (3)?

- A. definition of an altitude
 B. definition of a perpendicular bisector
 C. reflexive property
 D. definition of a right angle

14. Given: \overline{WY} is the angle bisector of $\angle XWZ$
 $m\angle XYW = m\angle ZYW$

Prove: $\triangle WXY \cong \triangle WZY$



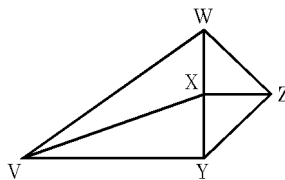
statement	reason
\overline{WY} is the \angle bisector of $\angle XWZ$	(1)
$m\angle XWY = m\angle ZWY$	(2)
$WY = WY$	(3)
$m\angle XYW = m\angle ZYW$	(4)
$\triangle WXY \cong \triangle WZY$	(5)

In the above proof, what is reason (1)?

- A. given
- B. definition of an altitude
- C. definition of a perpendicular bisector
- D. definition of a perpendicular

15. Given: \overline{VX} is a median of $\triangle VWY$
 $WZ = YZ$

Prove: $\triangle WXZ \cong \triangle YXZ$



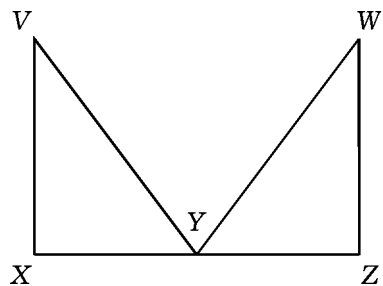
Statement	Reason
\overline{VX} is a median of $\triangle VWY$	(1)
X is the midpoint of \overline{WY}	(2)
$WX = YX$	(3)
$XZ = XZ$	(4)
$WZ = YZ$	(5)
$\triangle WXZ \cong \triangle YXZ$	(6)

In the above proof, what is reason (2)?

- A. definition of altitude
- B. definition of median
- C. definition of midpoint
- D. given

16. Given: $VY = WY$
 $VX = WZ$
 Y is the midpoint of \overline{XZ}

Prove: $\triangle VXY \cong \triangle WYZ$



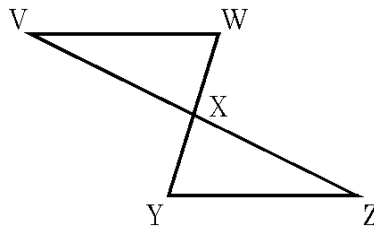
statement	reason
Y is the midpoint of \overline{XZ}	(1)
$XY = YZ$	(2)
$VY = WY$	(3)
$VX = WZ$	(4)
$\triangle VXY \cong \triangle WYZ$	(5)

In the above proof, what is reason (2)?

- A. definition of angle midpoint
- B. definition of midpoint
- C. definition of bisector
- D. definition of perpendicular bisector

17. Given: $\overline{VW} \parallel \overline{ZY}$
 $WX = YX$

Prove: $\triangle VWX \cong \triangle XYZ$



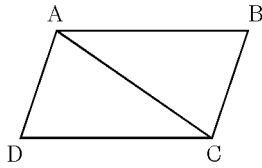
Statement	Reason
$\overline{VW} \parallel \overline{ZY}$	(1)
$m\angle W = m\angle Y$	(2)
$WX = YX$	(3)
$m\angle VXW = m\angle ZXY$	(4)
$\triangle VWX \cong \triangle ZYX$	(5)

In this proof, what is the reason for (5)?

- A. SAS
- B. ASA
- C. SSS
- D. HL

18. Given: $\overline{AB} \parallel \overline{DC}$
 $AB = DC$

Prove: $m\angle DAC = m\angle BCA$



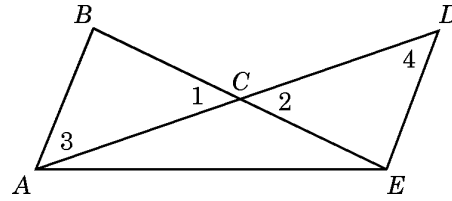
Statement	Reason
$\overline{AB} \parallel \overline{DC}$	(1)
$AB = DC$	(2)
$m\angle BAC = m\angle DCA$	(3)
$AC = AC$	(4)
$\triangle ADC \cong \triangle CBA$	(5)
$m\angle DAC = m\angle BCA$	(6)

In the above proof, what is reason (6)?

- A. CPCTC
- B. SSS
- C. vertical angles
- D. alternate interior angles

19. Given: \overline{AC} is the median to \overline{BE}
 \overline{EC} is the median to \overline{AD}

Prove: $\overline{AB} \parallel \overline{ED}$



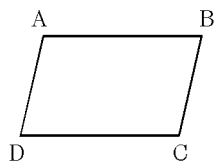
statement	reason
1. \overline{AC} is the median to \overline{BE}	
2. $BC = CE$	
3. $m\angle 1 = m\angle 2$	
4. \overline{EC} is the median to \overline{AD}	
5. $AC = CD$	
6. $\triangle ACB \cong \triangle DCE$	
7. $m\angle 3 = m\angle 4$	
8. $\overline{AB} \parallel \overline{ED}$	

In the proof, what is the reason for line 3?

- A. alternate interior angles are congruent
- B. vertical angles are congruent
- C. corresponding angles are congruent
- D. definition of a median

20. Given: $AB = DC$
 $\overline{AB} \parallel \overline{DC}$

Prove: $m\angle DAC = m\angle BCA$

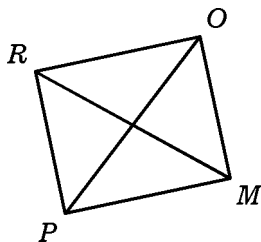


statement	reason
Join \overline{AC}	
$\overline{AB} \parallel \overline{DC}$	(1)
$AB = DC$	(2)
$m\angle BAC = m\angle DCA$	(3)
$AC = AC$	(4)
$\triangle ADC \cong \triangle CBA$	(5)
$m\angle DAC = m\angle BCA$	(6)

In the above proof, what is reason (4)?

- A. ASA
- B. SAS
- C. same side (reflexive)
- D. alternate interior angles

21.



Quadrilateral $PROM$ is a parallelogram with $\overline{MR} \perp \overline{PO}$ and $\angle ROP$ complementary to $\angle POM$.

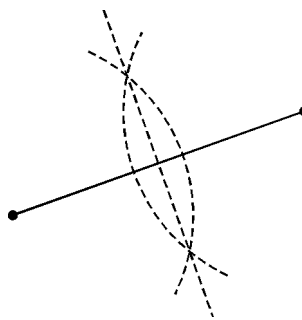
Which of the following statements is true?

- I. Quadrilateral $PROM$ is a rhombus
 - II. Quadrilateral $PROM$ is a square
 - III. Quadrilateral $PROM$ is a rectangle
- A. I only
 - B. III only
 - C. I and II
 - D. I, II, and III

22. $ABCD$ is a parallelogram (not a rhombus or rectangle). Which of the following statements regarding this parallelogram is *definitely* false?

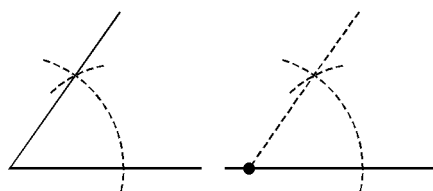
- A. $\overline{AB} \parallel \overline{DC}$
- B. $\angle A \cong \angle C$
- C. $\overline{BC} \cong \overline{CD}$
- D. $\angle D$ is obtuse

23. Using the diagram, identify the dashed line segment.



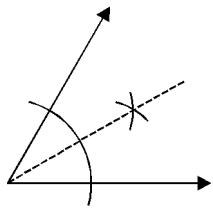
- A. median
- B. altitude
- C. angle bisector
- D. perpendicular bisector

24. The drawing shows how to—



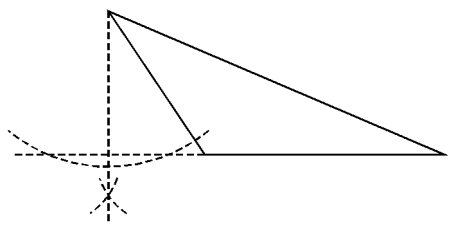
- A. construct an angle congruent to a given angle
- B. construct an equilateral triangle
- C. draw an angle bisector
- D. draw a perpendicular line through a point on a line

25. The drawing shows how to—



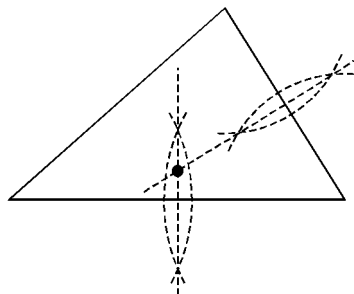
- A. construct a perpendicular bisector
- B. draw complementary angles
- C. bisect an angle
- D. inscribe an angle

26. The diagram shows a method for constructing _____.



- A. an equilateral triangle
- B. an altitude of a triangle
- C. a perpendicular through a point on a line
- D. a line parallel to a given line

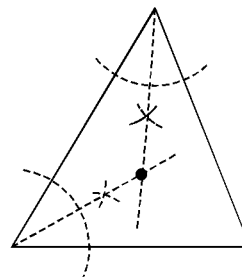
27. The diagram shows a method for constructing _____.



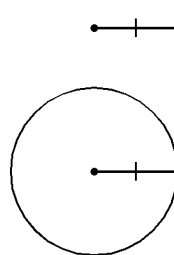
- A. an incenter
- B. a circumcenter
- C. an orthocenter
- D. a centroid

28. The diagram shows a method for constructing _____.

- A. an incenter
- B. a circumcenter
- C. an orthocenter
- D. a centroid



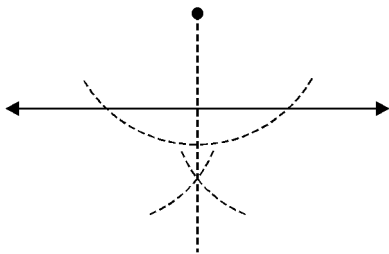
29. The drawing shows how to _____.



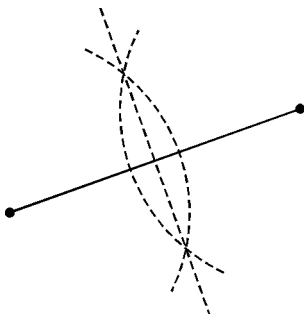
- A. construct a circle having a given radius
- B. construct a 90° angle
- C. construct an obtuse angle
- D. construct an arc of a certain length

30. Which of the following shows the construction of an altitude?

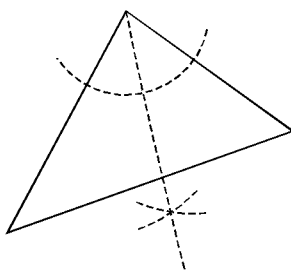
A.



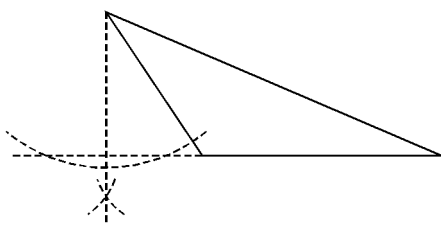
B.



C.

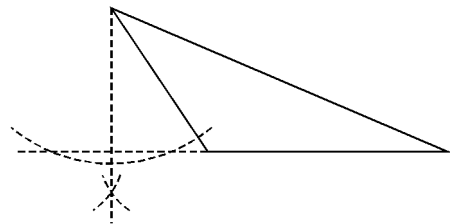


D.

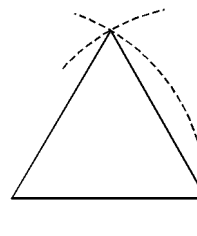


31. Which of the following figures shows the construction of an angle bisector?

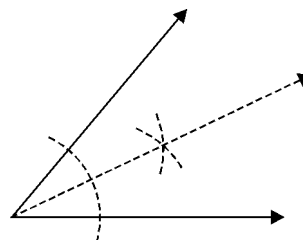
A.



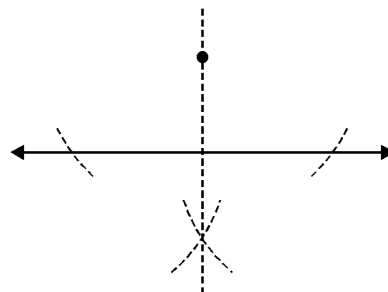
B.



C.



D.



32. What are the coordinates of point $(2, 3)$ after a translation to the right of 2 units and down 5 units, and then a dilation by a factor of 1.5 about $(0, 0)$?

A. $(6, -3)$

B. $(0, -1)$

C. $(3, 0)$

D. $(0, 2)$

33. What are the coordinates of point $(2, 3)$ after a translation to the right of 2 units and down 5 units, and then a dilation by a factor of 0.5 about $(0, 0)$?

A. $(-6, -3)$

B. $(2, -1)$

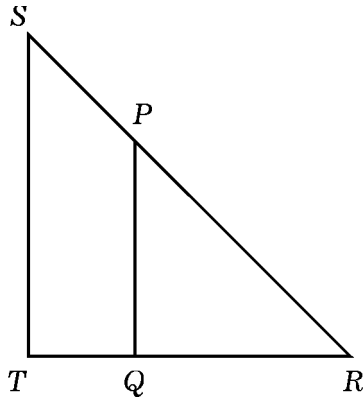
C. $(3, 0)$

D. $(0, 2)$

34. What are the coordinates of point $(2, 3)$ after a translation to the left of 2 units and down 5 units, and then a dilation by a factor of 0.5 about $(0, 0)$?

A. $(-6, -3)$ B. $(-2, -1)$
C. $(0, -1)$ D. $(0, 2)$

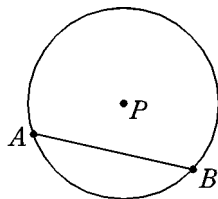
35. Which of these statements, if true, is sufficient to prove that triangles STR and PQR are similar?



A. $TQ = \frac{1}{2} \cdot QR$ B. $\triangle PQR$ is isosceles
C. $\angle S \cong \angle R$ D. $\angle S \cong \angle QPR$

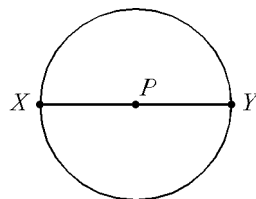
36. In circle P , \overline{AB} is a _____.

A. diameter
B. radius
C. circumference
D. chord

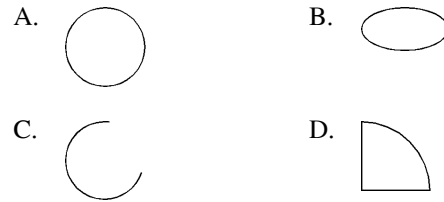


37. In circle P , \overline{XY} is a _____.

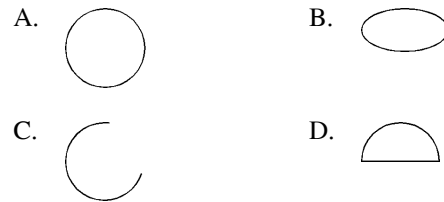
A. radius
B. diameter
C. chord
D. circumference



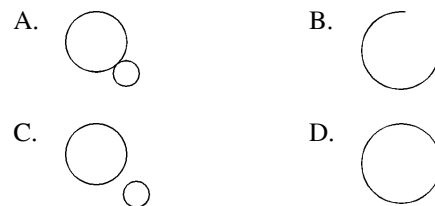
38. Which of the following is an arc?



39. Which of the following appears to be a semicircle?

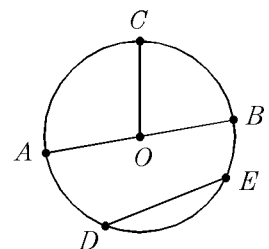


40. Which of the following circles are tangent?



41. Name an arc of circle O .

A. \overline{CO} B. \widehat{AC}
C. \overline{AB} D. \widehat{AOB}



42. What part of the circle is \widehat{DE} ?

A. chord B. diameter
C. arc D. center

43. What part of the circle is \overline{BA} ?

A. radius B. arc
C. center D. diameter

44. Which of the following statements, if any, are true about a circle?

- I. All of their chords are congruent.
- II. Their total number of degrees is 360.
- III. They have exactly two diameters.

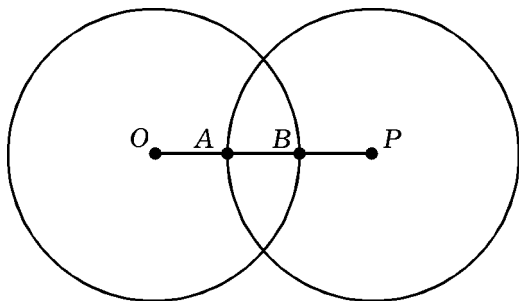
- A. II only
- B. III only
- C. I and II
- D. all of the statements are true

45. Which of the following statements, if any, are true about a circle?

- I. They are a type of polygon.
- II. The length of the diameter is twice the radius.
- III. All of their radii are congruent.

- A. II only
- B. I and II
- C. II and III
- D. none of the statements are true

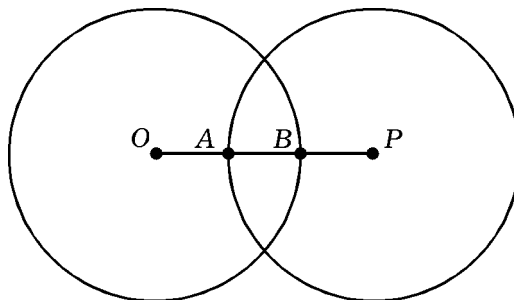
46. In order to create a pattern for a blanket, Shondra needs to use two congruent circles as shown.



If $OP = 31$ inches and $AB = 5$ inches, what is the radius of one of the circles?

- A. 13 in
- B. 15.5 in
- C. 16.5 in
- D. 18 in

47. In order to create a pattern for a tile floor, Henry needs to use two congruent circles as shown.

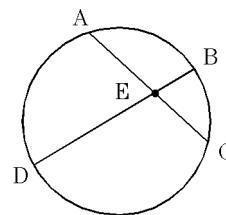


If $OP = 26$ centimeters and $AB = 8$ centimeters, what is the radius of one of the circles?

- A. 9 cm
- B. 13 cm
- C. 17 cm
- D. 18 cm

48. In the circle shown, chords AC and BD intersect at E . If $AE = 6$, $EC = 12$, and $DE = 18$. How long is BE ?

- A. 4
- B. 6
- C. 8
- D. 7.5

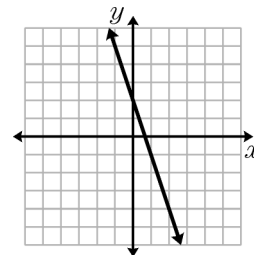


49. In the circle shown, chords AC and BD intersect at E . If $AE = 8$, $EC = 6$, and $BE = 4$. How long is DE ?

- A. 10
- B. 12
- C. 14
- D. 16

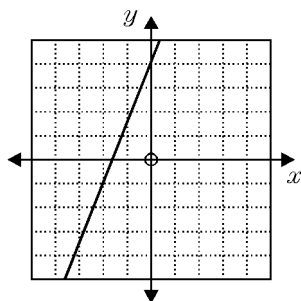
50. What is the equation of the line perpendicular to the line shown in the diagram that passes through the point $(-2, -4)$?

- A. $x + 3y = -14$
- B. $x - 3y = 10$
- C. $3x - y = -2$
- D. $2x + 3y = -16$

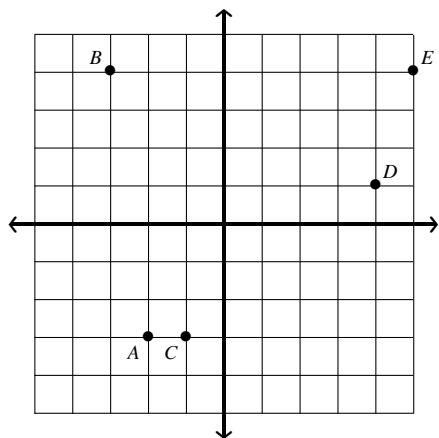


51. Which of the following is the equation of a line parallel to the line shown in the diagram?

- A. $5x + 2y = 13$
 B. $5x - 2y = 17$
 C. $2x + 5y = -3$
 D. $5x + 3y = 11$

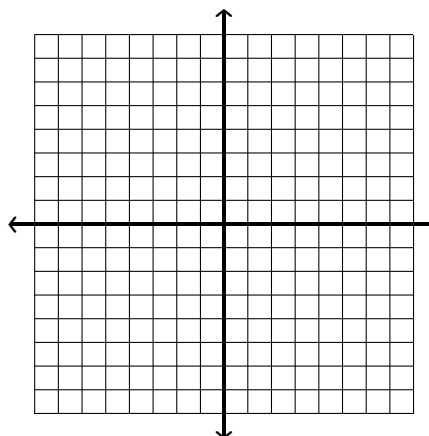


52. Draw the line that is parallel to $y = 2x + 5$ and passes through the point $(2, 3)$. Select the point through which the graph passes.



- A. B B. C C. D D. E

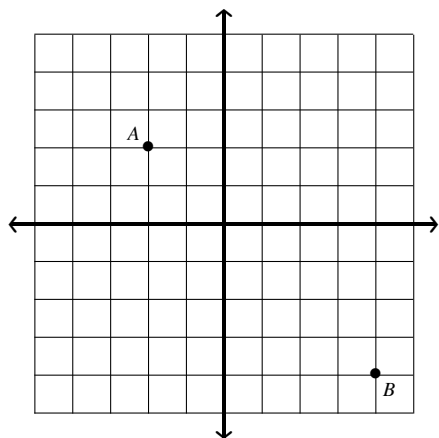
53. On the graph below, draw line m such that it passes through the point $(4, -2)$ and is parallel to the line $y = 2x - 3$.



Which one of the following points is on line m ?

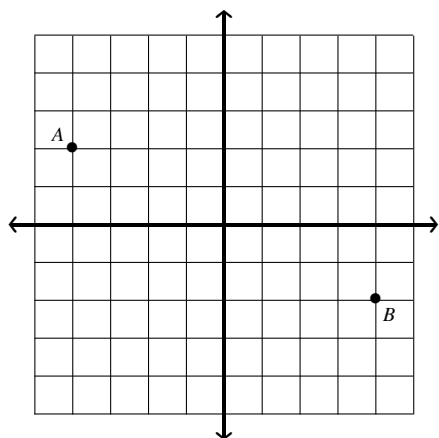
- A. $(0, 8)$ B. $(6, 0)$ C. $(2, 6)$ D. $(6, 2)$
54. A line has a slope of $\frac{3}{7}$. What is the slope of any line parallel to this line?
 A. $-\frac{7}{3}$ B. $-\frac{3}{7}$ C. $\frac{3}{7}$ D. $\frac{7}{3}$
55. A line has a slope of $\frac{3}{4}$. What is the slope of any line perpendicular to this line?
 A. $-\frac{4}{3}$ B. $-\frac{3}{4}$
 C. $\frac{3}{4}$ D. undefined
56. What is the slope of a line that is perpendicular to the line joining $(8, 1)$ and $(24, 9)$?
 A. -2 B. $\frac{1}{23}$ C. $\frac{1}{2}$ D. 2
57. What is the slope of a line that is parallel to the line joining $(7, -5)$ and $(-5, 7)$?
 A. 1 B. 12 C. -1 D. -12

58. Join \overline{AB} on the coordinate plane. Determine the midpoint of \overline{AB} .



- A. $(1, -1)$ B. $(1, 0)$
C. $(-1, -1)$ D. $(-1, 1)$

59. Join \overline{AB} on the coordinate plane. Determine the midpoint of \overline{AB} .



- A. $(0, 0)$ B. $(1, -1)$
C. $(-1, 0)$ D. $(-1, 1)$

60. Determine the coordinates of the midpoint of the line segment with endpoints $C(-4, 6)$ and $D(-4, -3)$.

- A. $(-4, 1.5)$ B. $(-4, 2)$
C. $(-4, 3)$ D. $(4, 1.5)$

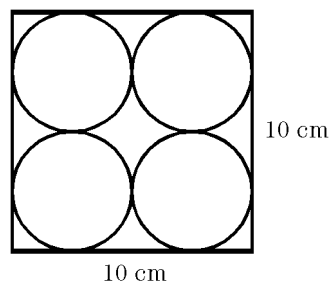
61. One end of a line segment has the coordinates $(-3, -8)$. If the middle point is $(5, 8)$, then what are the coordinates of the other endpoint?

- A. $(13, 24)$ B. $(7, 8)$
C. $(-15, -64)$ D. $(15, 64)$

62. One endpoint of a line segment is at $(1, 2)$. The midpoint of the line segment is at $(5, 8)$. Determine the coordinate of the other endpoint.

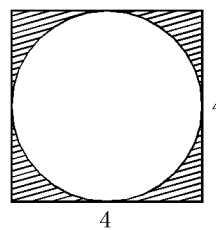
- A. $(-4, -6)$ B. $(-3, -4)$
C. $(6, 10)$ D. $(9, 14)$

63. What is a reasonable estimate for the area of one of the circles?



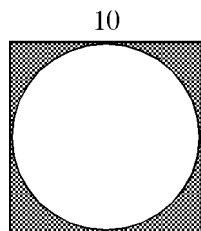
- A. less than 5 cm^2 B. about 10 cm^2
C. about 20 cm^2 D. more than 35 cm^2

64. Based on the diagram below, what is a reasonable estimate for the area of the shaded region?



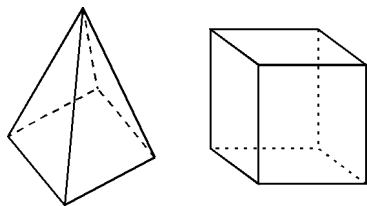
- A. less than 4 units^2 B. less than 6 units^2
C. less than 7 units^2 D. less than 8 units^2

65. Based on the diagram below, what is a reasonable estimate for the area of the shaded region?



- A. less than 15 units² B. less than 20 units²
C. less than 25 units² D. less than 50 units²

66.



A regular square pyramid has the same base area, x , and altitude, h , as a rectangular solid that has a square base congruent to that of the pyramid. Which formula can be used to find the volume of the pyramid in terms of the rectangular solid?

- A. $V = xh$ B. $V = x + h$
C. $V = \frac{1}{3}xh$ D. $V = \frac{1}{3}(x + h)$

67. The Leaning Tower of Pisa most closely resembles which geometric solid?

- A. triangular prism
B. cylinder
C. square-based pyramid
D. cone

68. Epcot Center can be modeled by a _____.

- A. square-based pyramid
B. rectangular prism
C. sphere
D. cylinder

69. In 2011, the National Science Foundation conducted a germ study. They found that the dirtiest item in most homes was the kitchen sponge with 10 million bacteria. Given that the average kitchen sponge is 0.5 in by 3 in by 5 in, what is the bacterial density? Round to 4 significant digits.

- A. 2.667×10^5 bacteria per inch³
B. 6.667×10^5 bacteria per inch³
C. 2.667×10^6 bacteria per inch³
D. 1.333×10^6 bacteria per inch³

70. In 2010, the Centers for Disease Control and Prevention conducted a K–12 school germ study. They found that the dirtiest area was students desktops with 13 million bacteria. Given that the average school desk is 16 in by 24 in, what is the bacterial density? Round to 4 significant digits.

- A. 3.385×10^4 bacteria per inch²
B. 2.257×10^4 bacteria per inch²
C. 5.078×10^6 bacteria per inch²
D. 1.333×10^6 bacteria per inch²

71. In 1991 the population of Alberta was approximately 2.5×10^6 . If its land area is approximately 6.44×10^5 square kilometers, then what is its population density (people per square kilometer)?

- A. ≈ 0.39 B. ≈ 2.6
C. ≈ 3.9 D. ≈ 38.8

72. According to the 2010 Census, Riverside, California had a population of 310651. Its area is 203 km². What was the population density of Riverside? Round to the nearest whole number.

- A. 3004 people per km²
B. 1530 people per km²
C. 1303 people per km²
D. 151 people per km²