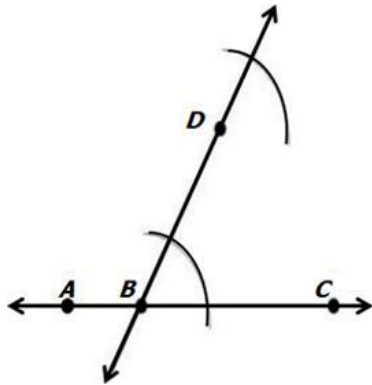


Geometry Magic 20 - Set 1 Answer Key

1. What type of construction is shown?



- A. A line segment congruent to a given line segment
- B. A perpendicular bisector of a line segment
- C. A perpendicular to a given line from a point not on the line
- D. A line parallel to a given line through a point not on the given line

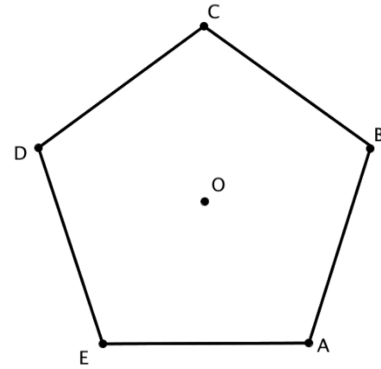
2. Select **two** equations of lines that are perpendicular to the line whose equation is $2x + 14y = 70$.

- A. $y = 7x + 10$
- B. $y = -\frac{1}{5}x + 12$
- C. $y = -7x + 5$
- D. $y = \frac{1}{7}x + 8$
- E. $3y = 21x + 8$

3. Which of the following is the definition of a line?

- A. An exact location
- B. Part of a line with one endpoint continuing on in one direction
- C. A collection of points going on and on in both directions
- D. Two endpoints and all of the points in between

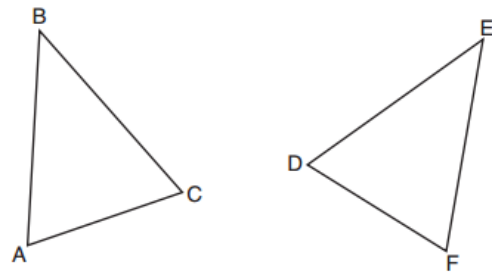
4. A regular pentagon is shown in the diagram below.



If the pentagon is rotated clockwise around its center, then what is the minimum number of degrees it must be rotated to carry the pentagon onto itself?

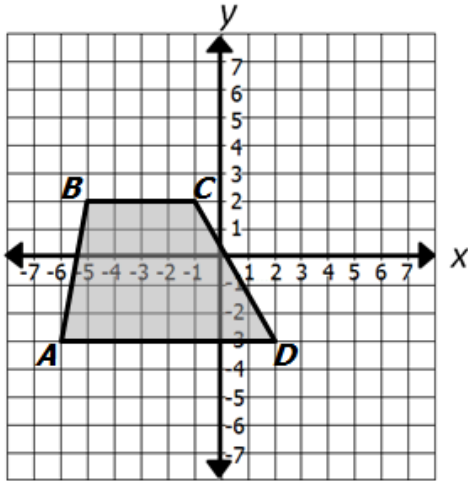
- A. 54°
- B. 72°
- C. 108°
- D. 360°

5. Which statement is sufficient evidence that $\triangle DEF$ is congruent to $\triangle ABC$?



- A. $AB = DE$ and $BC = EF$
- B. $\angle D \cong \angle A$, $\angle B \cong \angle E$, $\angle C \cong \angle F$
- C. There is a sequence of rigid motions that maps AB onto DE , BC onto EF , and AC onto DF .
- D. There is a sequence of rigid motions that maps point A onto point D , AB onto DE , and $\angle B$ onto $\angle E$.

6. Polygon $ABCD$ is rotated 270 degrees counterclockwise around the origin.



Identify the coordinates of B' . Write your response in the form (x, y) ?

(2, 5)

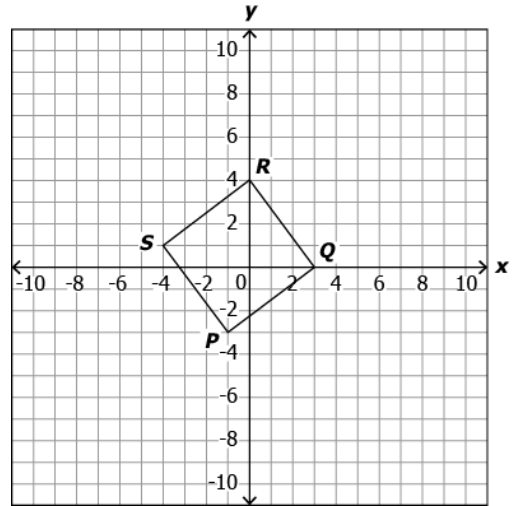
7. Triangle FXY is rotated and then translated to a new location and named triangle ABC . Which of the following is true?

- A. $\triangle FXY$ is not congruent to $\triangle ABC$ because non-rigid motions were performed.
- B. $\triangle FXY$ is congruent to $\triangle ABC$ because non-rigid motions were performed.
- C. **$\triangle FXY$ is congruent to $\triangle ABC$ because only rigid motions were performed.**
- D. $\triangle FXY$ is not congruent to $\triangle ABC$ because only rigid motions were performed.

8. Quadrilateral $PQRS$ is translated to form Quadrilateral $P'Q'R'S'$. Which statement must be true?

- A. **\overline{PQ} and $\overline{P'Q'}$ are congruent.**
- B. \overline{PQ} and $\overline{P'Q'}$ are never parallel.
- C. \overline{PQ} and $\overline{P'Q'}$ are parallel but not congruent.
- D. \overline{PQ} and $\overline{P'Q'}$ are neither parallel nor congruent.

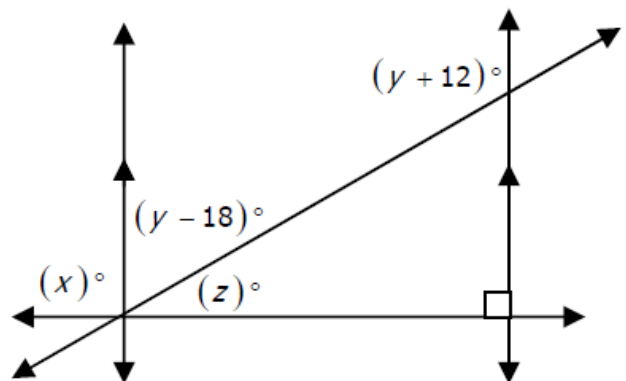
9. A polygon $PQRS$ is given.



Identify the true statements about the polygon $PQRS$.

- A. Perimeter of $PQRS$ is 12 units.
- B. Area of $PQRS$ is 16 square units.
- C. Area of $PQRS$ is 9 square units.
- D. **Area of $PQRS$ is 25 square units.**
- E. **Perimeter of $PQRS$ is 20 units.**
- F. Perimeter of $PQRS$ is 16 units.

10. Find the values of x , y , and z .



$x =$

90

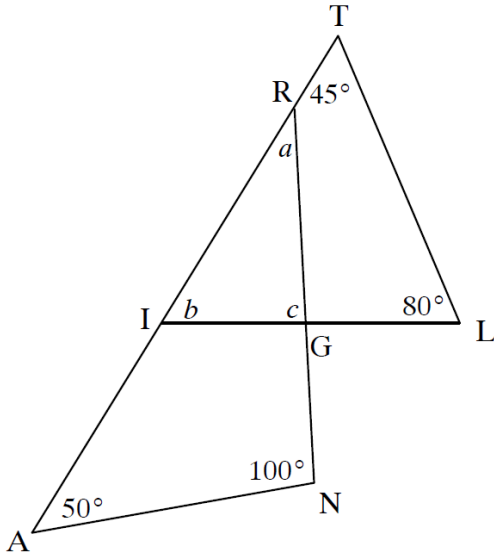
$y =$

93

$z =$

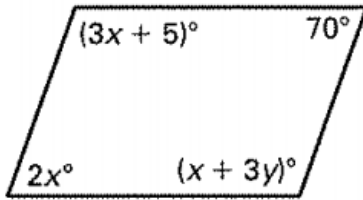
15

11. Triangle TIL overlaps triangle RAN . Triangle RIG is formed. What is the $m\angle c$ in triangle RIG ?



- A. 30°
 B. 55°
 C. 85°
 D. 95°

12. What value of x and y will make the polygon below a parallelogram?



$x =$

$y =$

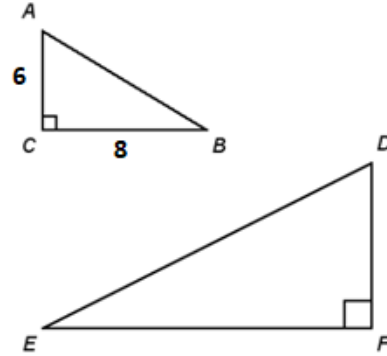
13. The center of a circle is at $(7, -2)$ and the point $(6, 3)$ is on the circle. Which is the equation for the circle.

- A. $(x - 7)^2 + (y + 2)^2 = \sqrt{26}$
 B. $(x - 7)^2 + (y + 2)^2 = 26$
 C. $(x + 7)^2 + (y - 2)^2 = \sqrt{26}$
 D. $(x + 7)^2 + (y - 2)^2 = 26$

14. What is the equation of the line parallel to $3x + 2y = 8$ and passes through the point $(4, -3)$?

- A. $y = -\frac{3}{2}x - \frac{1}{2}$
 B. $y = \frac{2}{3}x - \frac{17}{3}$
 C. $y = -\frac{3}{2}x + 3$
 D. $y = \frac{2}{3}x + 6$

15. In the figure below, $\triangle ABC \sim \triangle DEF$. Find $\sin D$.



- A. $\frac{4}{5}$
 B. $\frac{4}{3}$
 C. $\frac{5}{4}$
 D. $\frac{3}{4}$

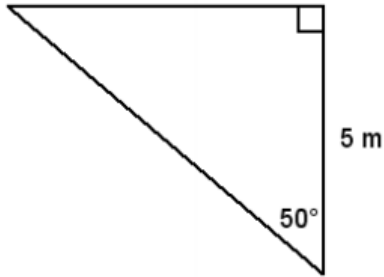
16. Given that $\cos 75^\circ \approx 0.259$, which statement below is also true?

- A. $\sin 15^\circ \approx 0.259$
 B. $\sin 75^\circ \approx 0.259$
 C. $\sin 15^\circ \approx 0.966$
 D. $\cos 15^\circ \approx 0.259$

17. A student constructs the image of line m under a dilation with center O not on m and scale factor 3. Which of the following best describes the image of line m ?

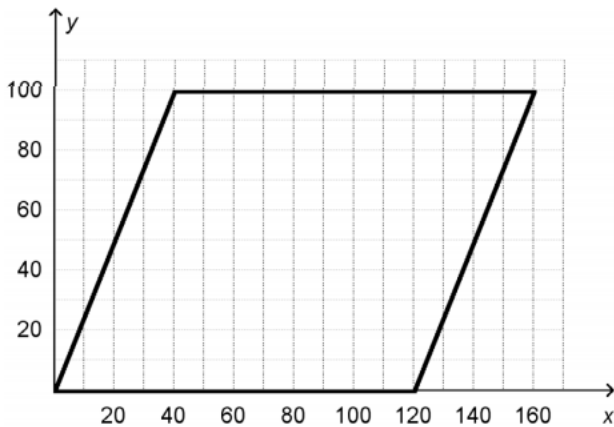
- A. The image of line m is a line parallel to line m .
 B. The image of line m is a line perpendicular to line m .
 C. The image of line m is a line passing through point O that intersects line m .
 D. Line m is its own image under the dilation.

18. Priya has planted a garden shaped like a right triangle. One leg of the triangle is 5 meters long, and the angle formed by it and the hypotenuse is 50° . If Priya wants to build a fence around her garden, how many meters of fence will she need? Round your answer to the nearest meter.



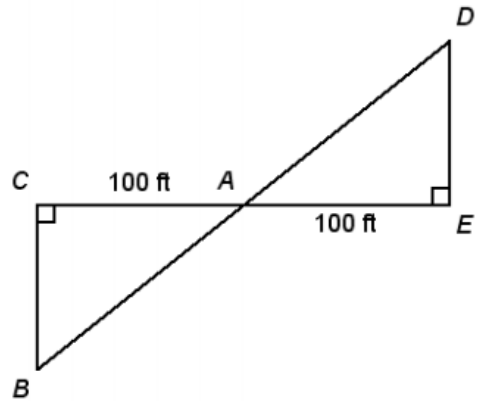
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19. The population of the county modeled by the quadrilateral below is 1,500,000. Each unit on the grid represents 1 mile. To the nearest whole person, what is the population density of the county?



- A. 104 people per square mile
 B. 125 people per square mile
 C. 150 people per square mile
 D. 1250 people per square mile

20. A jogging path runs along the river from point C to point E , passing through point A . You want to find the distance DE across a river using indirect measurement. Which congruence criterion can be used to show that $\triangle ABC \cong \triangle ADE$?



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