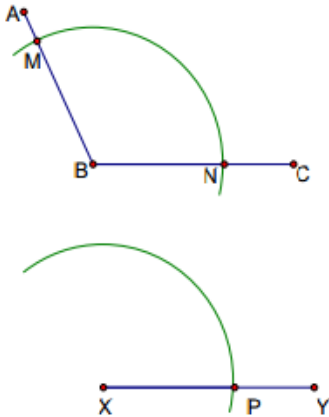


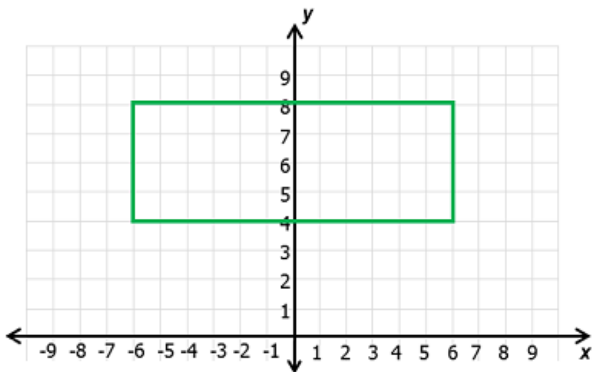
Geometry Magic 20 - Set 3 Answer Key

1. Tina is constructing an angle congruent to $\angle ABC$. What is her next step?



- A. Using MN as the radius, place the center of the compass on P and construct an intersecting arc.
- B. Using MB as the radius, place the center of the compass on P and construct an intersecting arc.**
- C. Using MN as the radius, place the center of the compass on Y and construct an intersecting arc.
- D. Using MN as the radius, place the center of the compass on X and construct the intersecting arc.

2. A rectangle is shown.



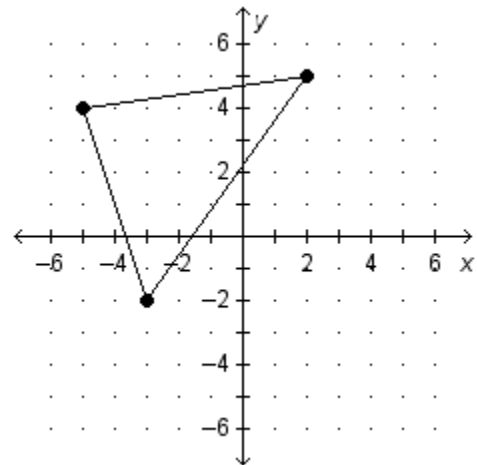
Which transformation will **NOT** map the rectangle onto itself?

- A. A reflection over the y -axis
- B. A rotation of 180° about the point $(0,6)$
- C. A rotation of 90° about the origin**
- D. A reflection over the line $y = 6$

3. Which of the following best describes the correct definition of the term?

- A. A line has no dimension and is one of the undefined terms of geometry.
- B. A ray is a straight arrangement of points extending without end in opposite directions.
- C. A point is part of a line that consists of a point called an endpoint and all points on the line that extend in one direction.
- D. A line segment is a part of a line that consists of two points called endpoints and all of the points between those endpoints.**

4. Which of the following are the vertices of the image of the figure below under the translation $(x, y) \rightarrow (x + 4, y - 2)$?



Choose all that apply.

- A. $(-1, 2)$**
- B. $(-9, 6)$
- C. $(-2, 7)$
- D. $(6, 3)$**
- E. $(1, -4)$**
- F. $(-7, 0)$

5. The equation of a line is $2x + 3y = 4$. Select **three** lines that are parallel to the given line.

A. $2x + 3y = 2$

B. $2x + 5y = 15$

C. $9y = -6x + 15$

D. $3y = -2x - 12$

E. $3x - 2y = 15$

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

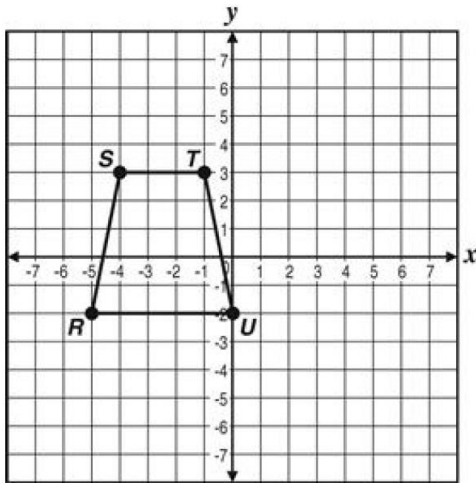
A. $\triangle FXY$ is congruent to $\triangle ABC$ because only rigid motions were performed.

B. $\triangle FXY$ is congruent to $\triangle ABC$ because non-rigid motions were performed.

C. $\triangle FXY$ is not congruent to $\triangle ABC$ because only rigid motions were performed.

D. $\triangle FXY$ is not congruent to $\triangle ABC$ because non-rigid motions were performed.

7. Which is closest to the perimeter of Figure $RSTU$?



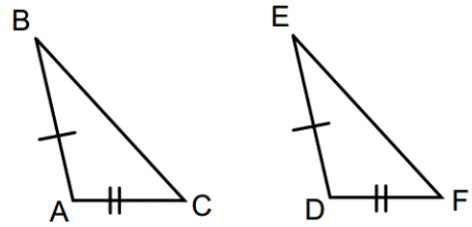
A. $8 + \sqrt{26}$

B. 18

C. 20

D. $8 + 2\sqrt{26}$

8. Veronica is trying to prove $\triangle ABC \cong \triangle DEF$.



Which statement would not help to prove the two triangles congruent?

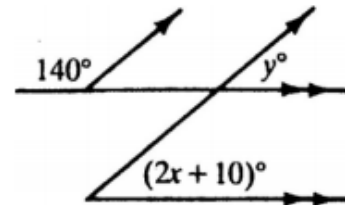
A. $\angle C \cong \angle F$

B. $BC \cong EF$

C. $\angle A \cong \angle D$

D. $DE \cong AB$

9. Find the values of x and y .

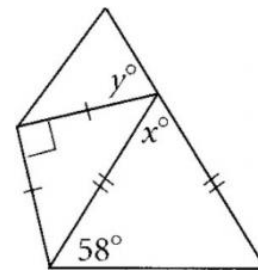


$x =$

15

$y =$

40



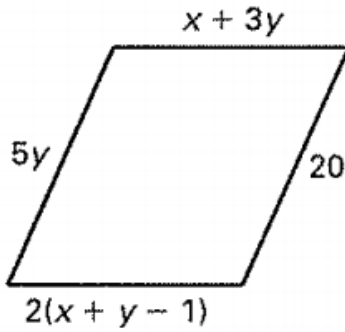
$x =$

64

$y =$

71

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



$x =$

$y =$

11. Point S is reflected about the x -axis in the coordinate plane and then rotated 90° counterclockwise about the origin to create Point S' . Which relationship between S' and S must be true?

- A. S' is the same point as S .
- B. S' is S reflected about the y -axis.
- C. S' is S reflected about the line $y = -x$.
- D. S' is the result of switching coordinates of S .

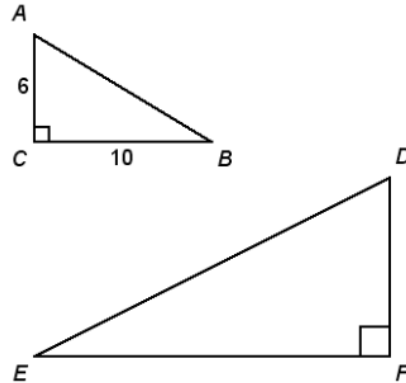
12. If one line passes through the points $(-3, 8)$ & $(1, 9)$, and a perpendicular line passes through the point $(-2, 4)$, what is another point that would lie on the 2nd line. Select all that apply.

- A. $(-1, 0)$
- B. $(2, 5)$
- C. $(5, 2)$
- D. $(-6, 3)$
- E. $(8, -3)$
- F. $(-3, 8)$

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. $(x - 7)^2 + (y + 2)^2 = 2$
- B. $(x - 7)^2 + (y + 2)^2 = 4$
- C. $(x + 7)^2 + (y - 2)^2 = 2$
- D. $(x + 7)^2 + (y - 2)^2 = 4$

14. In the figure below, $\triangle ABC \sim \triangle DEF$. Find the ratio $\frac{EF}{DF}$.



- A. $\frac{3}{5}$
- B. $\frac{\sqrt{34}}{5}$
- C. $\frac{5}{3}$
- D. $\frac{\sqrt{34}}{3}$

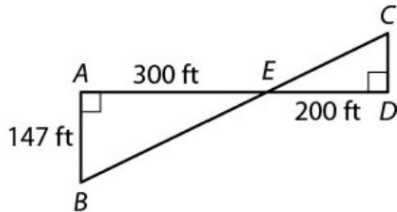
15. If $\sin 52^\circ \approx 0.788$, what is the approximate value of $\cos 38^\circ$?

- A. 0.212
- B. 0.384
- C. 0.616
- D. 0.788

16. An iron paperweight has the shape of a cube with side length 5 cm. Iron has a density of 7.874 grams per cubic centimeter. What is the mass of the paperweight?

- A. 15.88 g
- B. 39.37 g
- C. 196.85 g
- D. 984.25 g

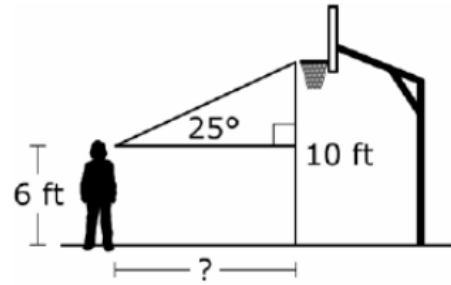
17. Andy wants to find the distance across a river. In order to find the distance CD , Andy stands at point D , directly across from point C , and walks 200 feet to the left, placing a marker at a point E . Andy continues walking another 300 feet to point A , and then follows the path to the left, walking until the markers at points E and C line up. Andy marks this location B and measures AB . What is CD ?



- A. 33 ft
 B. 47 ft
 C. 98 ft
 D. 108 ft
18. $\triangle EFG$ has vertices $E(-4, 0)$, $F(-4, 4)$, and $G(0, 0)$. $\triangle HIJ$ has vertices $H(3, 2)$, $I(3, -3)$, and $J(-2, 2)$. Are $\triangle EFG$ and $\triangle HIJ$ similar? Select the transformations that map EFG to HIJ , and can be used to determine whether or not the triangles are similar.

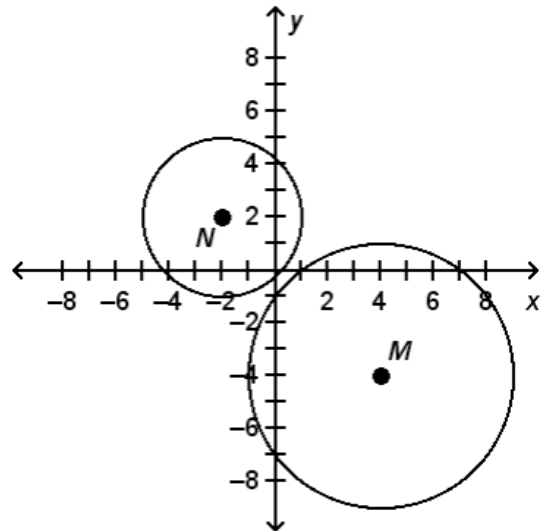
- A. Rotate 90° counterclockwise around $(3, 2)$.
 B. Rotate 180° clockwise around $(3, 2)$.
 C. $(x, y) \rightarrow (x - 7, y - 2)$
 D. $(x, y) \rightarrow (x - 2, y - 7)$
 E. $(x, y) \rightarrow \left(\frac{4}{5}x, \frac{4}{5}y\right)$
 F. $(x, y) \rightarrow (4x, 4y)$
 G. $(x, y) \rightarrow (5x, 5y)$

19. A basketball player looks directly at the rim that is 10 feet high. The angle of elevation from her eye level, which is 6 feet above the ground, to the rim is 25 degrees. To the nearest foot, how far away from the rim is she standing?



- A. 6 ft.
 B. 9 ft.
 C. 21 ft.
 D. 25 ft.

20. Which sequences of transformations will map circle M onto circle N ?



- A. a reflection across the line $x = 2$ followed by a translation 6 units to the left.
 B. a reflection across the line $y = -1$ followed by a translation 6 units to the left.
 C. a reflection across the line $y = x - 2$, followed by a dilation with center N and scale factor $\frac{3}{5}$.
 D. a translation 6 units up and 6 units to the left, followed by a dilation with center N and scale factor $\frac{3}{5}$.
 E. a dilation with center M and scale factor $\frac{5}{3}$ followed by a translation 6 units up and 6 units to the left.