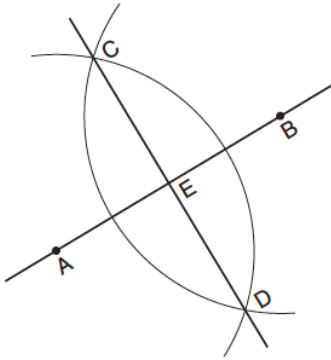


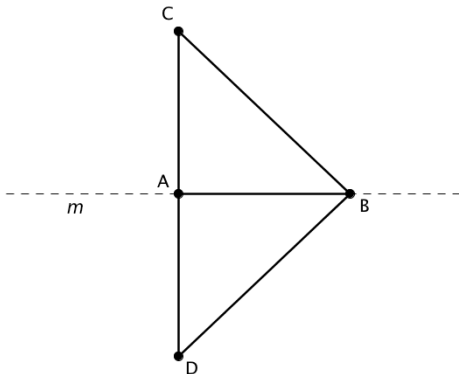
Geometry Magic 20 - Set 2

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



- A. $\overline{AB} \perp \overline{CD}$
- B. $AB = CD$
- C. $AE = EB$
- D. $CE = DE$

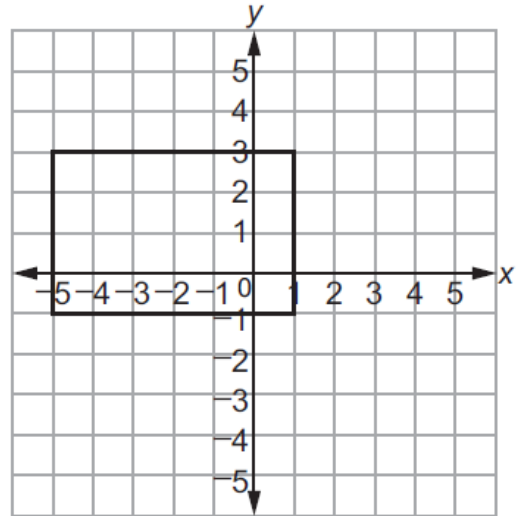
2. As shown in the diagram below, when right triangle DAB is reflected over the line m , its image is triangle CAB .



Which statement justifies why $\overline{CB} \cong \overline{DB}$?

- A. Distance is preserved under reflection.
- B. Orientation is preserved under reflection.
- C. Points on the line of reflection remain invariant.
- D. Right angles remain congruent under reflection.

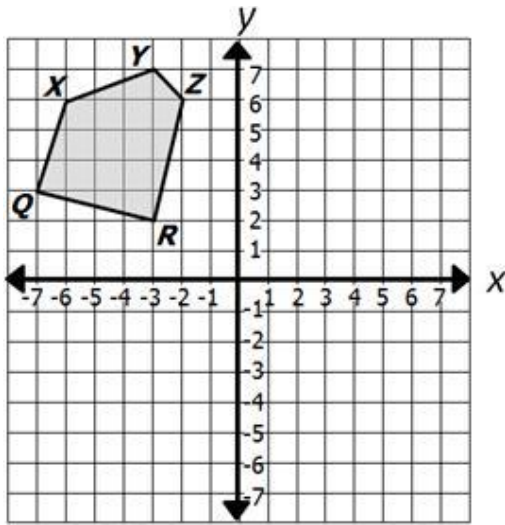
3. A rectangle is shown on the coordinate plane below.



Identify a line that the rectangle could be reflected over to result in a rectangle that has the same vertices as the original.

- A. $x = 0$
 - B. $x = 1$
 - C. $y = 0$
 - D. $y = 1$
4. Students in Ms. Garcia's geometry class created posters of geometric definitions. Which of the following is a precise definition?
- A. Parallel lines are lines that do not intersect.
 - B. A line segment is part of a line that has an endpoint.
 - C. An angle is formed by two lines, two segments or two rays in one plane.
 - D. Perpendicular lines are lines in the same plane that intersect at a right angle.

5. What are the new coordinates of point R after polygon $QXYZR$ is rotated 180° and translated 3 units left?

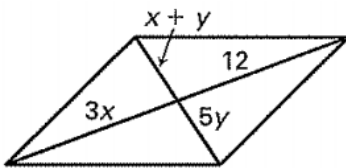


- A. $(-6, 2)$
- B. $(0, -2)$
- C. $(6, -2)$
- D. $(3, -2)$

6. The equation of a line is $3x - 5y = 8$. Select three lines that are parallel to the given line.

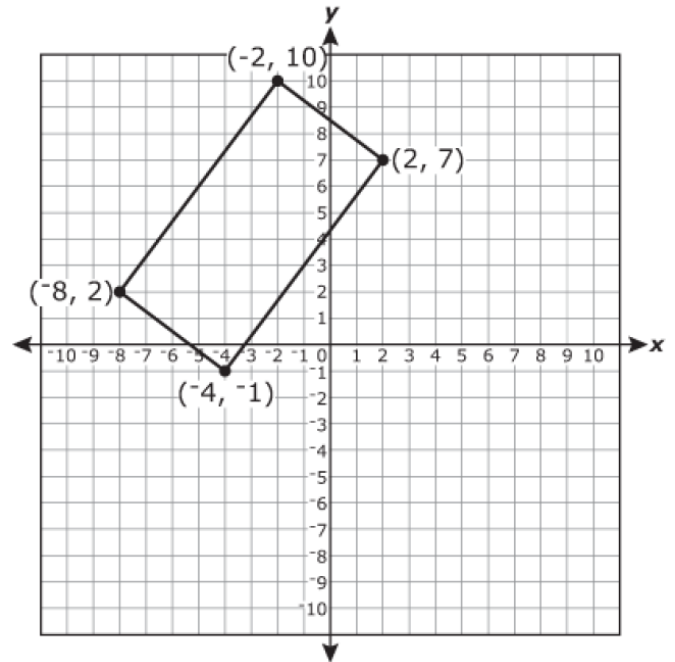
- A. $5x - 3y = 8$
- B. $9x - 10y = 16$
- C. $10y = 6x + 12$
- D. $12x - 20y = 24$
- E. $3x - 5y = 1$

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



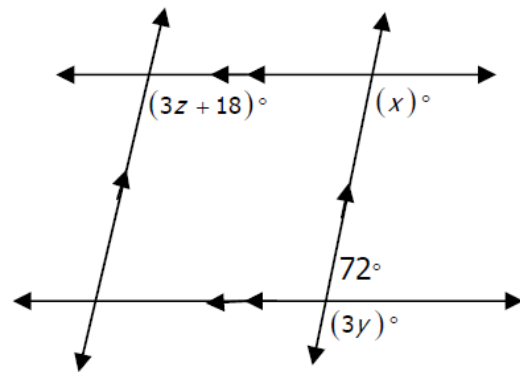
$x =$ $y =$

8. What is the area of the rectangle shown on the coordinate grid?



- A. 15 squared units
- B. 24 squared units
- C. 30 squared units
- D. 50 squared units

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



$x =$

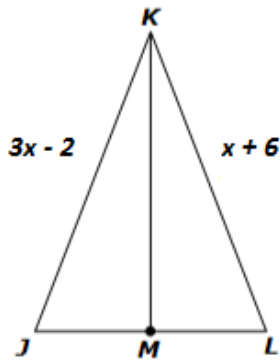
$y =$

$z =$

10. Which sequence of transformations of a figure will create an image that is NOT congruent to the original figure? Select all that apply.

- A. Dilation by a factor of 1 followed by a reflection about line $y = 2x$.
- B. Reflection about the line $y = x$ followed by a rotation of 90° about point $(2, 1)$.
- C. Translation by 5 units to the left on the x -axis followed by a dilation by a factor of 0.5.
- D. Rotation by 180° followed by a reflection about the y -axis.
- E. Reflection about the line $y = \frac{1}{3}x$ followed by a dilation by a factor of 3.

11. Examine the following figure.



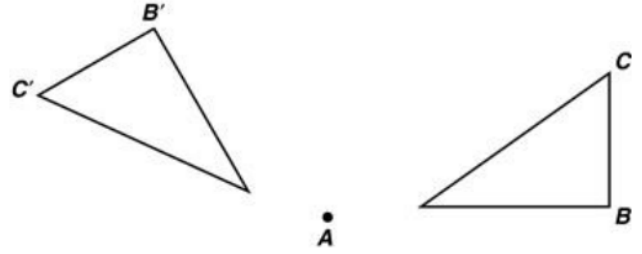
If $JL = 12$, $KM = 2x$, and KM is a perpendicular bisector of JL determine which of the following values are correct. Select all that apply.

- A. $x = 4$
- B. $JK = 10$
- C. $KM = 8$
- D. $ML = 6$
- E. Perimeter of $\triangle JKM = 22$
- F. Area of $\triangle JKL = 48$

12. What is the radius and center for $(x - 2)^2 + y^2 = 16$?

- A. $r = 16$; center is $(2, 0)$
- B. $r = 4$; center is $(-2, 0)$
- C. $r = 16$; center is $(-2, 0)$
- D. $r = 4$; center is $(2, 0)$

13. A rotation about Point A maps Point B to B' and Point C to C' .



Which statement must be true?

- A. $m\angle C'AB' = m\angle B'AC$
- B. $m\angle C'AC = m\angle B'AB$
- C. If Point B is $(1, -2)$ then Point B' must be $(-1, 2)$.
- D. If Point C is $(1, 4)$ then Point C' must be $(-4, 1)$.

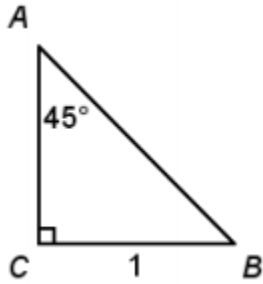
14. What is the equation of the line perpendicular to $y - 4 = \frac{2}{5}(x - 6)$ and passes through the point $(-3, 2)$?

- A. $y - 2 = -\frac{5}{2}(x + 3)$
- B. $y + 3 = -\frac{5}{2}(x - 2)$
- C. $y - 2 = \frac{2}{5}(x + 3)$
- D. $y + 3 = \frac{2}{5}(x - 2)$

15. Two right triangles are graphed on the coordinate plane. Triangle ABC has vertices $A(0, 0)$, $B(3, 0)$, and $C(0, 4)$. Triangle DEF has vertices $D(3, 7)$, $E(3, -2)$, and $F(-9, -2)$. Which of the following transformations cannot be used as part of a proof that ABC is similar to DEF ?

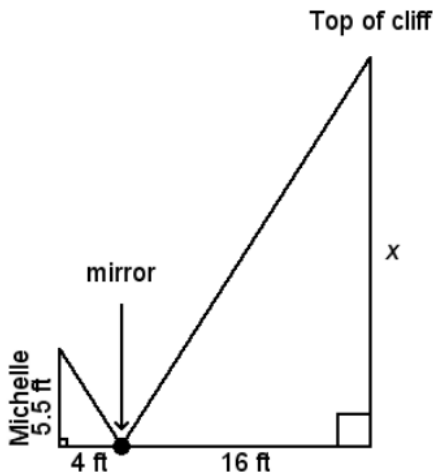
- A. Dilate ABC with a center at $(0, 0)$ and a scale factor of 3.
- B. Reflect ABC over the line $y = 0$.
- C. Rotate ABC 90° counterclockwise around the origin.
- D. Translate ABC using the transformation $(x, y) \rightarrow (x + 3, y - 2)$

16. Use the figure shown to determine which statement below is true.



- A. $\sin A + \cos A = 1$
- B. $\sin A = \cos A$
- C. $\sin A = \sqrt{2}$
- D. $\cos A = 1$

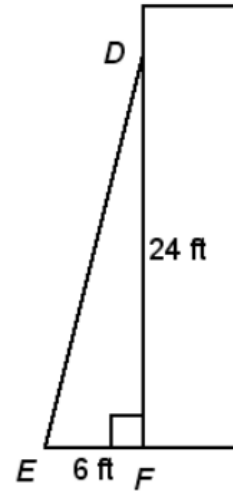
17. Before rock climbing, Michelle wants to know how high she will climb. She places a mirror on the ground and walks backward until she can see the top of the cliff in the mirror. She drew a sketch of the situation. What is the height of the cliff?



- A. 16.5
- B. 17.5
- C. 20
- D. 22

18. Greenland is the least densely populated country in the world, with a population of 57,714 and an area of 836,109 square miles. To the nearest hundredth, what is the population density of Greenland in people per square mile?

19. A ladder leans against the wall and reaches a point 24 feet up the wall. The base of the ladder is 6 feet from the wall. To the nearest degree, what angle does the ladder make with the wall?



20. Given circle C with radius r and circle D with radius s , what is an appropriate first step when proving circle C is similar to circle D?
- A. Transform circle C with a dilation that has center C and scale factor s .
 - B. Transform circle C with a dilation that has center C and scale factor r .
 - C. Transform circle C with the translation that maps point C onto point D.
 - D. Transform circle C with the translation that maps point onto point C.