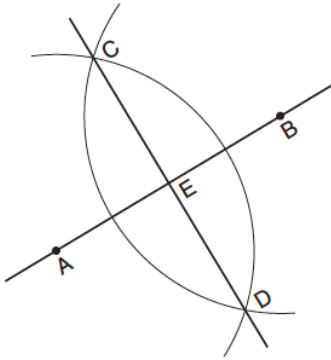


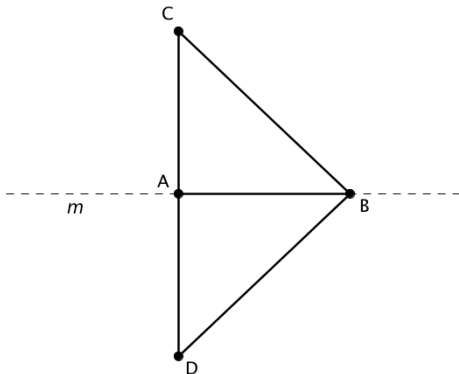
Geometry Magic 20 - Set 2 Answer Key

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. $CE = DE$

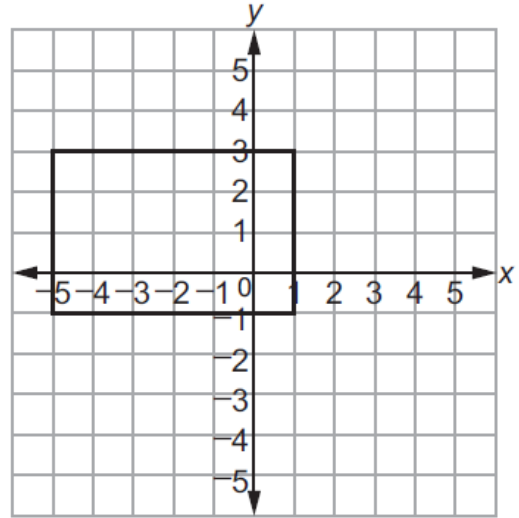
2. As shown in the diagram below, when right triangle DAB is reflected over the line m , its image is triangle CAB .



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.

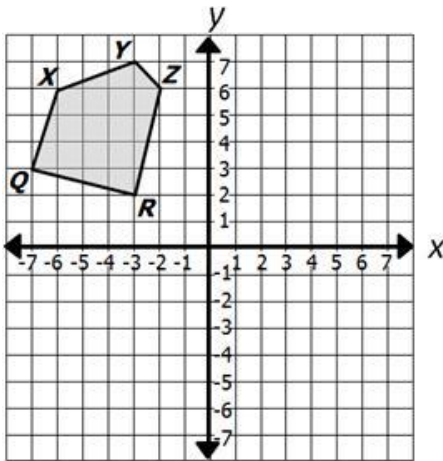
3. A rectangle is shown on the coordinate plane below.



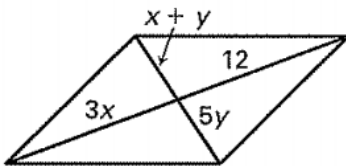
Identify a line that the rectangle could be reflected over to result in a rectangle that has the same vertices as the original.

- 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?



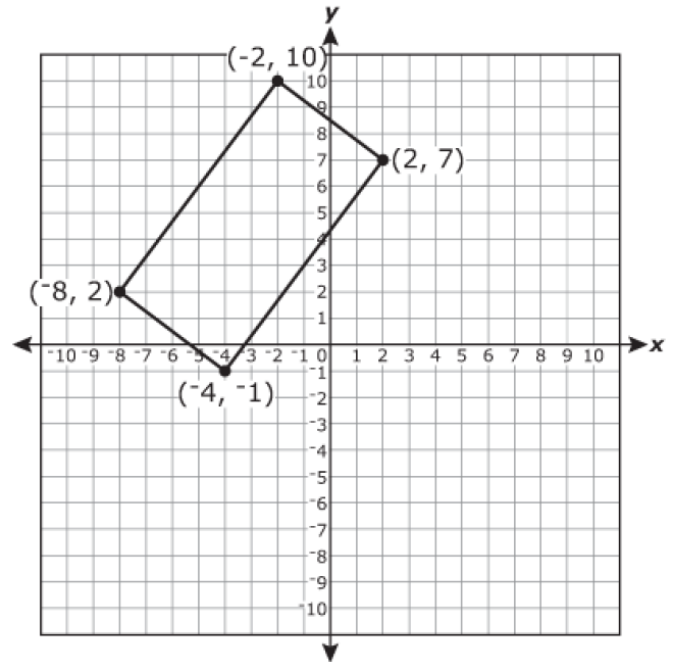
- A. $(-6, 2)$
B. $(0, -2)$
 C. $(6, -2)$
 D. $(3, -2)$
6. The equation of a line is $3x - 5y = 8$. Select three lines that are parallel to the given line.
- A. $5x - 3y = 8$
 B. $9x - 10y = 16$
C. $10y = 6x + 12$
D. $12x - 20y = 24$
E. $3x - 5y = 1$
7. What value of x and y will make the polygon below a parallelogram?



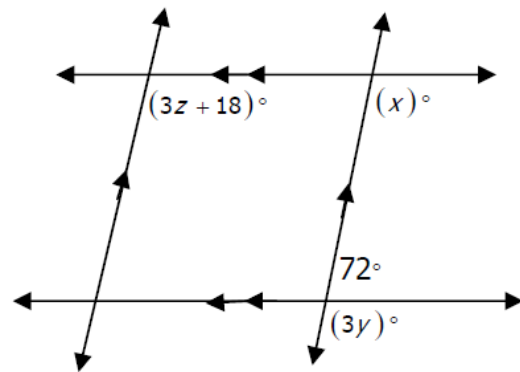
$x =$

$y =$

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



- A. 15 square units
 B. 24 square units
 C. 30 square units
D. 50 square units
9. Find the values of x , y , and z .



$x =$

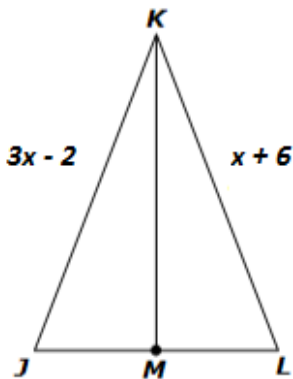
$y =$

$z =$

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.



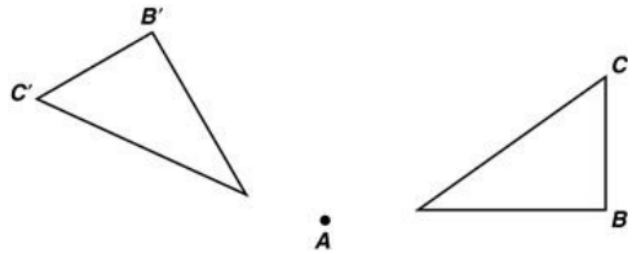
If $JL = 12$, $KM = 2x$, and KM is a perpendicular bisector of JL determine which of the following values are correct. Select all that apply.

- 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 $(-4, 1)$.

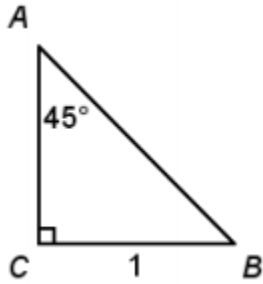
14. What is the equation of the line perpendicular to $y - 4 = \frac{2}{5}(x - 6)$ and passes through the point $(-3, 2)$?

- 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 ?

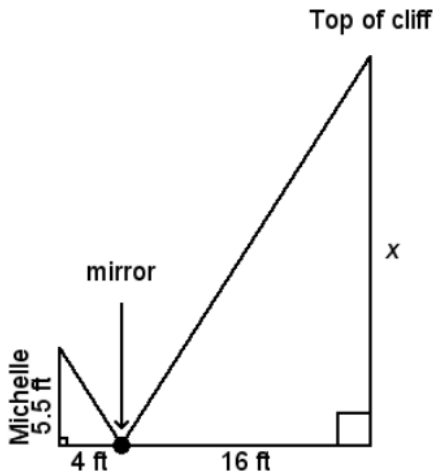
- A. Dilate ABC with a center at $(0, 0)$ and a scale factor of 3.
- B. Reflect ABC over the line $y = 0$.
- C. Rotate ABC 90° counterclockwise around the origin.
- D. Translate ABC using the transformation $(x, y) \rightarrow (x + 3, y - 2)$

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?

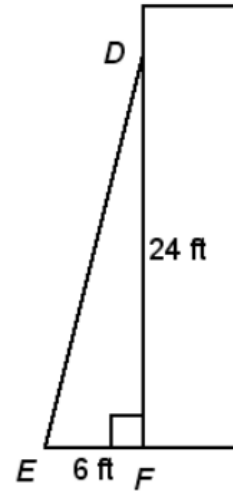


- A. 16.5
- B. 17.5
- C. 20
- D. 22

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?

0.07

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?



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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.