

# Geometry Practice Test – Unit 2

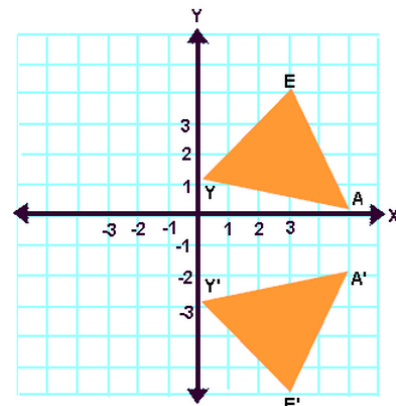
## Transformations in the Plane

(G.CO.A.2 - G.CO.A.5)

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Pd: \_\_\_\_\_

- 1) A certain transformation maps  $\triangle ABC$  to  $\triangle A'B'C'$ .
  - a) What is the image of  $\overline{BC}$ ?
  - b) What is  $T(A)$ ?
  - c) What is the pre-image of  $\angle B'$ ?
  
- 2) A positive angle of rotation turns a figure ... (multiple choice)
  - A) clockwise
  - B) counterclockwise
  
- 3) Which of the following transformations creates a figure that is similar (**but not congruent**) to the original figure? I. Translation II. Rotation III. Dilation (multiple choice)
  - A) I only
  - B) II only
  - C) III only
  - D) II and III
  
- 4) **Which transformation** is defined as a transformation along a vector such that the segment joining a point and its image has the same length as the vector and is parallel to the vector? (multiple choice)
  - A) Reflection
  - B) Dilation
  - C) Rotation
  - D) Translation
  
- 5) You ride in an elevator from the ground floor to the penthouse suite. **What type of transformation is this an example of?**
  
- 6) Using words, **describe the translation** that would be made by the rule:  $(x, y) \rightarrow (x - 5, y + 4)$ .
  
- 7) A statue at the park needs to be moved. Workers need to move it 7 yards north and 20 yards west. **Which of the following represents the job they must do?** (multiple choice)  
{Use North = Up and West = Left on your coordinate graph}
  - A) 20 yards in the  $-x$  direction and 7 yards in the  $+y$  direction.
  - B) 7 yards in the  $+x$  direction and 20 yards in the  $+y$  direction.
  - C) 20 yards in the  $+x$  direction and 7 yards in the  $+y$  direction.
  - D) 7 yards in the  $-x$  direction and 20 yards in the  $-y$  direction.
  
- 8) The line of reflection between these two triangles is  $y = -1$ .  
**true / false**

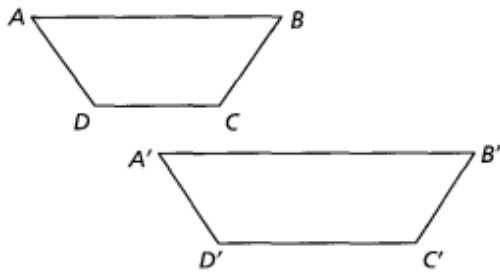




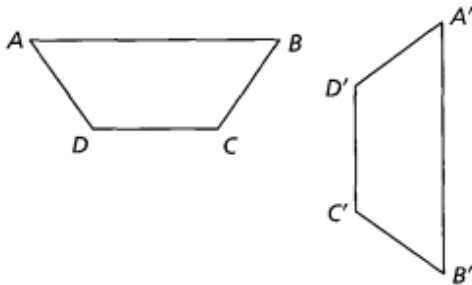
9) The figures show the pre-image ( $ABCD$ ) and image ( $A'B'C'D'$ ) under a transformation.

Determine which transformation is illustrated and whether the transformation appears to be rigid.

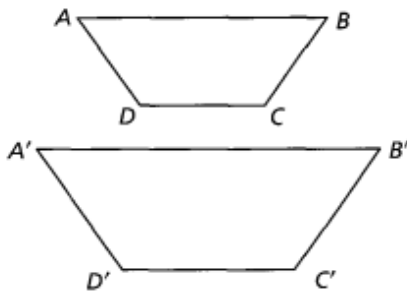
a)



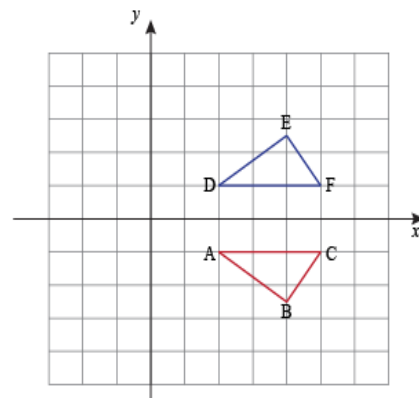
b)



c)



10) Which transformation maps  $\triangle ABC$  onto  $\triangle DEF$  ?



11) Determine if each statement is true or false:

- a) The image of the point  $(4, -3)$  under a reflection across the  $x$ -axis is  $(-4, -3)$ . true / false
- b) The image of the point  $(-5, 4)$  under a reflection across the  $y$ -axis is  $(5, 4)$ . true / false
- c) The image of the point  $(-1, 8)$  under a reflection across the line  $y = x$  is  $(8, -1)$ . true / false

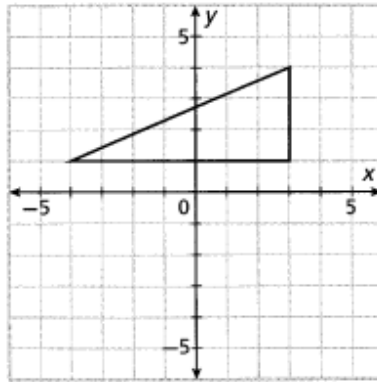
12) Name the image of each point after a reflection over the given line.

- a)  $(-4, 3)$ ;  $y$ -axis
- b)  $(5, 5)$ ;  $y = x$
- c)  $(-7, 0)$ ;  $x$ -axis

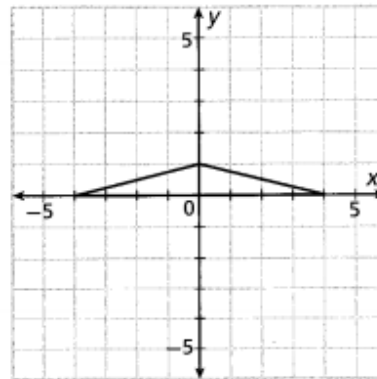


13) Mapping notation is used to indicate a transformation.

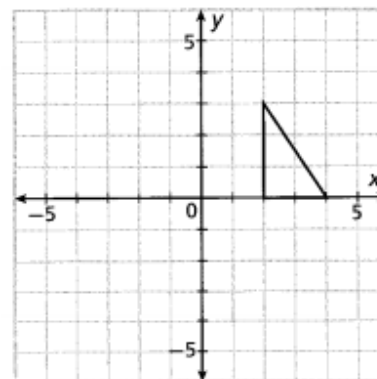
- i) **Graph the image** of the transformed figure
  - ii) **State the type** of transformation
  - iii) Determine if it is an **isometry**
- a)  $(x, y) \rightarrow (x, -y)$



- b)  $(x, y) \rightarrow (x, 3y)$

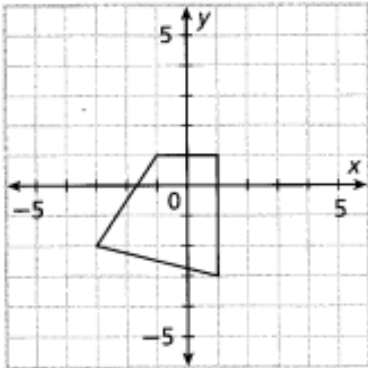


- c)  $(x, y) \rightarrow (x - 4, y - 4)$

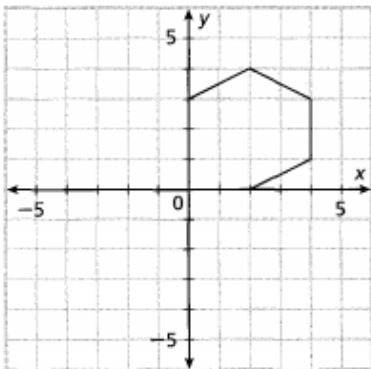




14) Graph the image of the figure under the given translation:  $\langle 3, -2 \rangle$

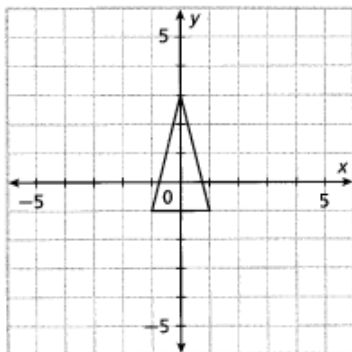


15) As the first step in designing a logo, you draw the figure shown in the first quadrant of the coordinate plane. Then you reflect the figure across the  $x$ -axis. You complete the design by reflecting the original figure and its image across the  $y$ -axis. **Draw the completed design.**



16) When point  $P$  is reflected across the  $y$ -axis, its image lies in Quadrant IV. When point  $P$  is reflected across the line  $y = x$ , its position does not change. **What can you say about the coordinates of point  $P$ ? In which quadrant would the pre-image point start?**

17) Suppose you **translate** the given triangle along  $\langle -10, -10 \rangle$  and then **reflect** the image across the  $y$ -axis.

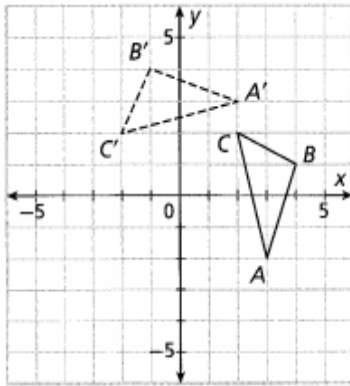


**In which quadrant would the final image lie? Write a single rule that completes both transformations.**

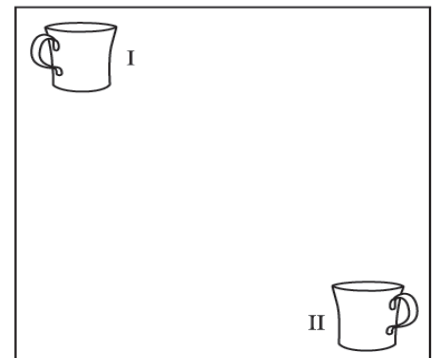
18) Point  $M$  is the midpoint of  $\overline{AB}$ . **After a rigid motion, can you conclude that  $M'$  is the midpoint of  $\overline{A'B'}$ ? Why or why not?**



19) Use coordinate notation to **write a rule** for the rotation that maps  $\triangle ABC$  to  $\triangle A'B'C'$ . **What is the angle of rotation?**



20) Jessica is a computer graphics designer and is working on an ad for the local coffee shop. The figure shows a coffee mug in two different positions. Which describes the transformation of the coffee mug in position I to the image in position II?



(multiple choice)

- A) a reflection over a horizontal line and a translation down.
- B) translation down and a reflection over a vertical line.
- C)  $180^\circ$  rotation.
- D) translation to the right and a reflection over a vertical line.

21) A student was asked to use coordinate notation to describe the result of a  $180^\circ$  rotation followed by a translation 3 units to the right and 5 units up. The student wrote this notation:

$(x, y) \rightarrow (-[x + 3], -[y + 5])$ . **Find and correct the student's error. Explain.**

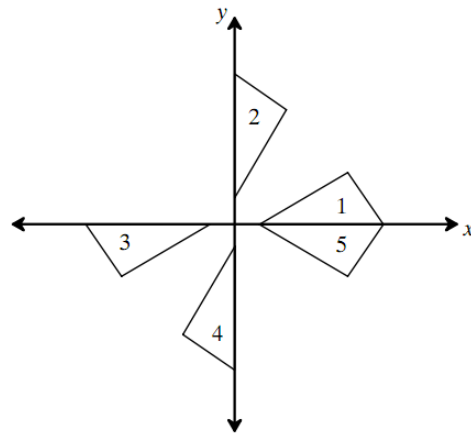
22) Which shadow shows a reflection of the corresponding figure? (multiple choice)

- A)
- B)
- C)
- D)



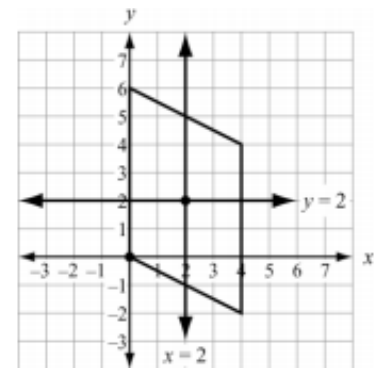
23) Which figure represents a **reflection** of figure 3?  
(multiple choice)

- A) figure 1
- B) figure 2
- C) figure 4
- D) figure 5

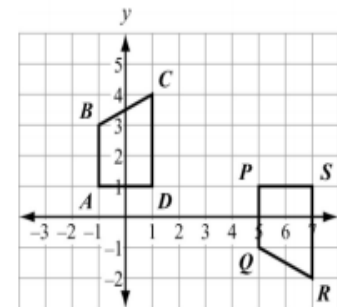


24) A parallelogram has vertices at (0, 0), (0, 6), (4, 4), and (4, -2).  
**Which transformation maps the parallelogram to itself?**  
(multiple choice)

- A) A reflection across the line  $x = 2$ .
- B) A reflection across the line  $y = 2$ .
- C) A rotation of  $180^\circ$  about the point (2, 2).
- D) A rotation of  $180^\circ$  about the point (0, 0).



25) Specify a **sequence of transformations** that will map  $ABCD$  to  $PQRS$ .



26) Which of the following capital letters (if written simply) has **line symmetry**?  
(multiple choice)

- A) F
- B) R
- C) O
- D) L

27) What are the coordinates of point  $T'$ , the image point of  $T(-2, 5)$  after a **reflection in the origin**?  
(multiple choice)

- A) (2, 5)
- B) (2, -5)
- C) (-2, -5)
- D) (5, -2)

28)  $\overline{JT}$  has coordinates  $J(-2, -5)$  and  $T(2, 3)$ . The segment is rotated about the origin  $180^\circ$  to form  $J'T'$ .  $J'T'$  is translated over 6 to the right and down 3 to form  $J''T''$ . **What are the coordinates of  $J'T'$  and  $J''T''$ ?**



**ANSWER SHEET – PRACTICE TEST!**

- 1) a) \_\_\_\_\_  
 b) \_\_\_\_\_  
 c) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

5) \_\_\_\_\_

6) \_\_\_\_\_  
 \_\_\_\_\_

7) \_\_\_\_\_

8) true / false

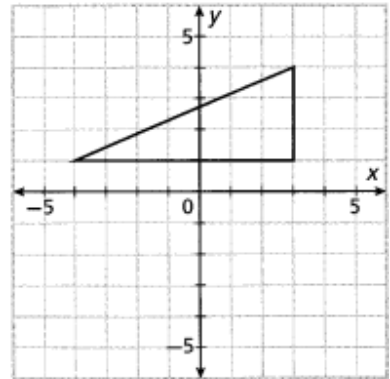
- 9) a) Type? \_\_\_\_\_  
 Rigid? \_\_\_\_\_  
 b) Type? \_\_\_\_\_  
 Rigid? \_\_\_\_\_  
 c) Type? \_\_\_\_\_  
 Rigid? \_\_\_\_\_

10) \_\_\_\_\_

- 11) a) true / false  
 b) true / false  
 c) true / false

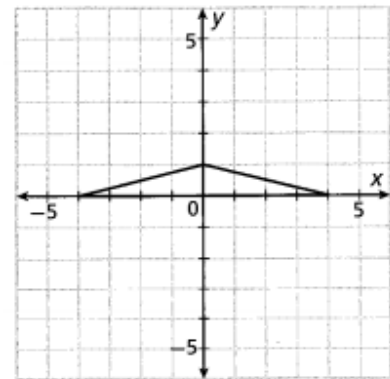
- 12) a) \_\_\_\_\_  
 b) \_\_\_\_\_  
 c) \_\_\_\_\_

13) a)



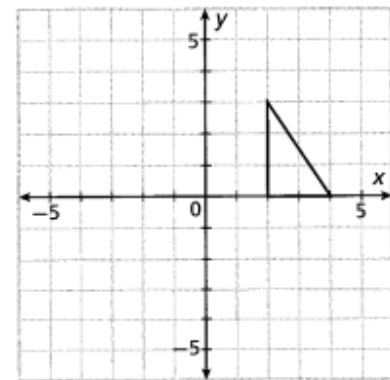
Type? \_\_\_\_\_  
 Isometry? \_\_\_\_\_

b)



Type? \_\_\_\_\_  
 Isometry? \_\_\_\_\_

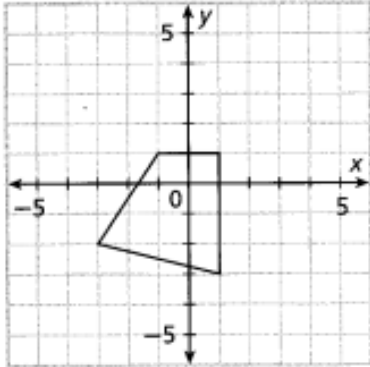
c)



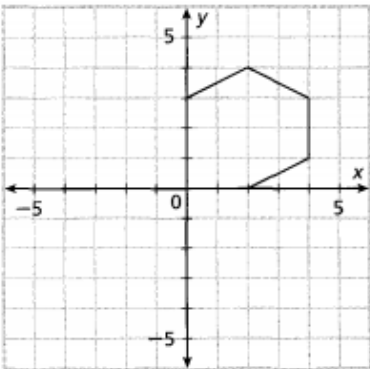
Type? \_\_\_\_\_  
 Isometry? \_\_\_\_\_



14)



15)



16) \_\_\_\_\_ ,  
\_\_\_\_\_

17) \_\_\_\_\_ ,  
\_\_\_\_\_

18) \_\_\_\_\_ ,  
\_\_\_\_\_

19) \_\_\_\_\_ ,  
\_\_\_\_\_

20) \_\_\_\_\_

21) \_\_\_\_\_ ,  
\_\_\_\_\_  
\_\_\_\_\_

22) \_\_\_\_\_

23) \_\_\_\_\_

24) \_\_\_\_\_

25) \_\_\_\_\_  
\_\_\_\_\_

26) \_\_\_\_\_

27) \_\_\_\_\_

28)  $J'$ : \_\_\_\_\_  $T'$ : \_\_\_\_\_  
 $J''$ : \_\_\_\_\_  $T''$ : \_\_\_\_\_