

*P.I. G.G.54: Define, investigate, justify, and apply isometries in the plane (rotations, reflection, translations, glide reflections)*

1. The  $x$ -axis is *not* the line of reflection for which of the following pairs of points?

[A]  $R'(1, 5) \rightarrow R'(1, -5)$

[B]  $R'(-2, -4) \rightarrow R'(-2, 4)$

[C]  $R'(-9, 4) \rightarrow R'(9, -4)$

[D]  $R'(3, -2) \rightarrow R'(3, 2)$

2. What is the reflection of  $(-2, 3)$  in the line  $y = -x$ ?

[A]  $(3, -2)$

[B]  $(3, 2)$

[C]  $(-3, 2)$

[D]  $(-3, -2)$

3. The graph of a pentagon is in Quadrant I.
- Describe a reflection that will result in a pentagon in Quadrant IV.
  - Describe a reflection that will result in a pentagon in Quadrant II.
  - Describe a reflection that will result in a pentagon in Quadrant III.

4. Reflect  $\triangle ABC$  in  $\overline{BC}$ . What kind of figure will result? How would your answer change if  $\triangle ABC$  is isosceles? a right triangle with right angle at  $A$ ? a right isosceles triangle with right angle at  $A$ ?

5. A reflection maps  $ABCD \rightarrow A'B'C'D'$ , where the coordinates of  $A'B'C'D'$  are the reverse of those of  $ABCD$ ; that is, if  $A = (x, y)$ , then  $A' = (y, x)$ . Which of the following statements is not true?

[A] If  $ABCD$  has a clockwise orientation, then  $A'B'C'D'$  has a counterclockwise rotation.

[B] If  $B$  is not on line  $y = x$ , then  $y = x$  is the perpendicular bisector of  $BB'$ .

[C] It is a reflection in the line  $x = 0$ .

[D]  $ABCD \cong A'B'C'D'$

6. The endpoints of  $\overline{OA}$  are  $O(0, 0)$  and  $A(4, 3)$ .  $\overline{OA}$  is reflected in the  $x$ -axis. Find the area of  $\triangle OAA'$ .

7. The area of a triangle graphed in the first quadrant is 15 sq units. What is the area after a reflection in the line  $x = -1$ ?

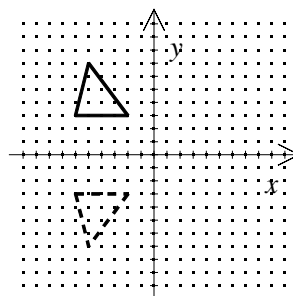
8. Given points  $A(0, 3)$ ,  $B(-2, 4)$ , and  $C(-3, -2)$ , draw  $\triangle ABC$  and its reflection image in the line  $x = y$ .

9. Plot five points and find their reflections in the line  $y = x$ . Then find their reflections in the line  $y = -x$ . Write a conjecture about the reflections of  $(x, y)$  in each line.

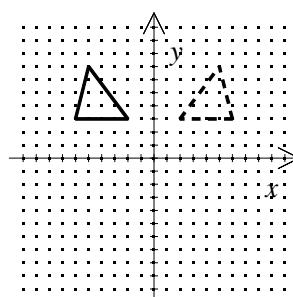
10. A pattern for a wall stencil was graphed on a coordinate plane. This quadrilateral has the following vertices:  $J(2, -1)$ ;  $K(5, 1)$ ;  $L(4, 4)$ ; and  $M(1, 3)$ . Find the coordinates of the reflection of  $JKLM$  over the  $y$ -axis. Graph this reflection on the same coordinate plane.

11. Graph the triangle with vertices  $(-6, 3)$ ,  $(-2, 3)$ , and  $(-5, 7)$ . Then, draw its image after a reflection across the  $x$ -axis.

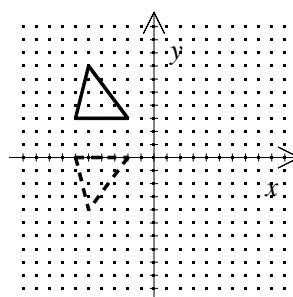
[A]



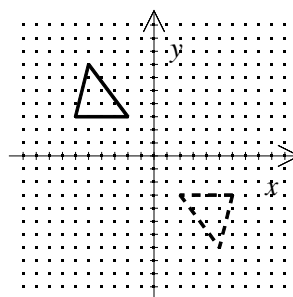
[B]



[C]



[D]



[1] C

[2] C

A. a reflection in the  $x$ -axis

B. a reflection in the  $y$ -axis

[3] C. a reflection in the line  $y = -x$

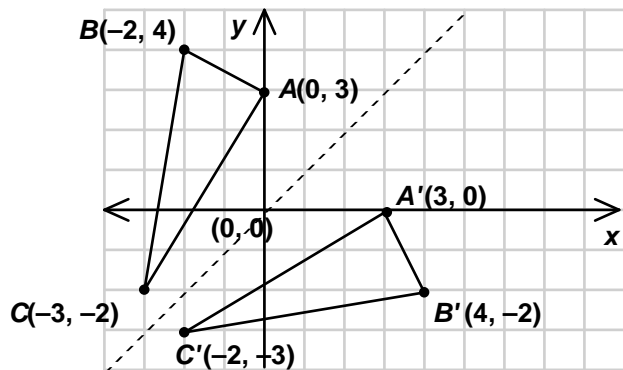
A quadrilateral unless either  $B$  or  $C$  is a right angle, in which case it will be a triangle; rhombus if  $\overline{BC}$  is

[4] the unequal side or if the triangle is isosceles; quadrilateral; square

[5] C

[6] 12 units<sup>2</sup>

[7] 15 sq units

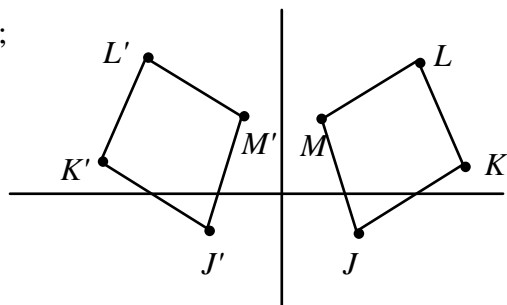


[8] \_\_\_\_\_

for  $y = x$ :  $(x, y) \rightarrow (y, x)$

[9] for  $y = -x$ :  $(x, y) \rightarrow (-y, -x)$

$J'(-2, -1)$ ,  $K'(-5, 1)$ ,  $L'(-4, 4)$ ,  $M'(-1, 2)$ ;



[10] \_\_\_\_\_

[11] A