Go to page 3 for the SOLUTIONS to the PRACTICE Assignment.

For questions 1-5, use the following transformations with each question:

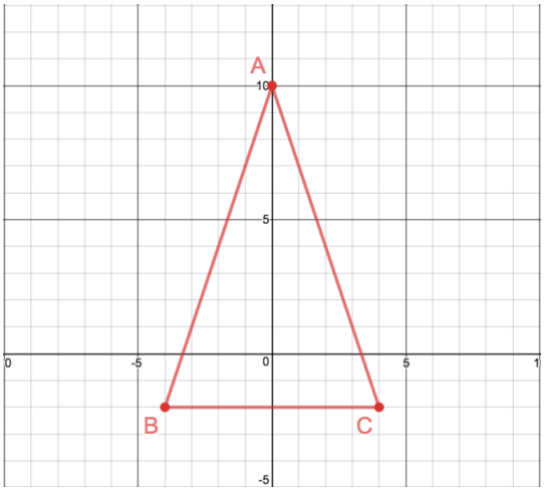
- Reflection across the x-axis
- Reflection across the y-axis
- Reflection across the y = x
- Reflection across the y = -x

1. What is the image of A(1,-3)?
2. What is the image of C(-5, 2)?
3. What is the preimage of D′(-12,-7)?
4. What is the image of B(a, b)?
5. What is the image of F(x + 2, y)?

The vertices of △ABC are A(6,−3),B(−3,−1) and C(5,2). Find the vertices of △A′B′C′, given the translation rules below and describe what type of transformation occurred.

6. (x,y)→(-x, y)
7. (x,y)→(-y, -x)
8. (x,y)→(y, x)
9. (x,y)→(x, -y)

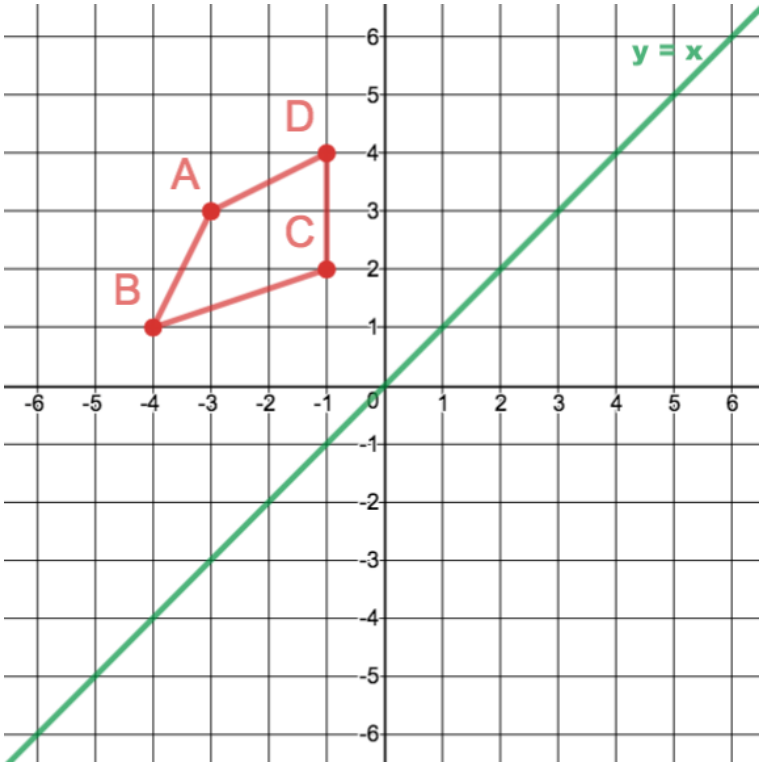
Use the figure below to answer each question.



10. Reflect ΔABC across the y-axis.

11. Reflectional symmetry is when a figure is reflected across a line and the image looks identical to the preimage. Are there any more lines of symmetry associated with ΔABC?

Use the figure below to answer each question.



12. Reflect vertex C across the line y = x.

13. Draw a line connecting C to C' and label the intersection of this line with y = x as point E.

14. A **perpendicular bisector** divides a segment into two equal parts and is perpendicular to the segment. In this case, y = x can be described as the perpendicular bisector of segment CC'. Verify that y = x will be the perpendicular bisector of segment BB' under the same reflection.

Key

For questions 1-5, use the following transformations with each question:

- Reflection across the x-axis $(x,y) \rightarrow (x,-y)$
- Reflection across the y-axis $(x,y) \rightarrow (-x,y)$
- Reflection across the y = x $(x,y) \rightarrow (y,x)$
- Reflection across the y = -x $(x,y) \rightarrow (-y,-x)$

1. What is the image of A(1,-3)?
   a. Reflection across the x-axis A'(1, 3)
   $A(1,-3) \rightarrow A'(1,3)$
   b. Reflection across the y-axis A'(-1, -3)
   $A(1,-3) \rightarrow A'(-1,-3)$
   c. Reflection across the y = x A' (-3, 1)
   $A(1,-3) \rightarrow A'(-3,1)$
   d. Reflection across the y = -x A'(3, -1)
   $A(1,-3) \rightarrow A'(3,-1)$
2. What is the image of C(-5, 2)?
   a. Reflection across the x-axis C'(-5, -2)
   $C(-5,2) \rightarrow C'(-5,-2)$
   b. Reflection across the y-axis C'(5, 2)
   $C(-5,2) \rightarrow C'(5,2)$
   c. Reflection across the y = x C'(2, -5)
   $C(-5,2) \rightarrow C'(2,-5)$
   d. Reflection across the y = -x C'(-2, 5)
   $C(-5,2) \rightarrow C'(-2,5)$
3. What is the preimage of D′(-12,-7)?
   a. Reflection across the x-axis D(-12, 7)
   $D'(-12,-7) \rightarrow D(-12,7)$
   b. Reflection across the y-axis D(12, -7)
   $D'(-12,-7) \rightarrow D(12,-7)$

c. Reflection across the y = x D(-7, -12)

$D'(-12,-7) \rightarrow D(-7,-12)$

d. Reflection across the y = -x D(7, 12)

$D'(-12,-7) \rightarrow D(7,12)$

4. What is the image of B(a, b)?
   a. Reflection across the x-axis B'(a, -b)

$B(a,b) \rightarrow B'(a,-b)$

   b. Reflection across the y-axis B'(-a, b)

$B(a,b) \rightarrow B'(-a,b)$

   c. Reflection across the y = x B'(b, a)

$B(a,b) \rightarrow B'(b,a)$

   d. Reflection across the y = -x B'(-b, -a)

$B(a,b) \rightarrow B'(-b,-a)$

5. What is the image of F(x + 2, y)?
   a. Reflection across the x-axis F'(x + 2, -y)

$F(x+2,y) \rightarrow F'(x+2,-y)$

   b. Reflection across the y-axis F'(-x - 2, y)

$F(x+2,y) \rightarrow F'(-(x+2),y) \rightarrow F'(-x-2,y)$

   c. Reflection across the y = x F'(y, x + 2)

$F(x+2,y) \rightarrow F'(y,x+2)$

   d. Reflection across the y = -x F'(-y, -x - 2)

$F(x+2,y) \rightarrow F'(-y,-(x+2)) \rightarrow F'(-y,-x-2)$

The vertices of △ABC are A(6,−3),B(−3,−1) and C(5,2). Find the vertices of △A′B′C′, given the transformation rules below and describe what type of transformation occurred.

6. (x,y)→(-x, y) Reflection across the y - axis A'(-6, -3), B'(3, -1), and C'(-5, 2)

$A(6,-3) \rightarrow A'(-6,-3), B(-3,-1) \rightarrow B'(3,-1), C(5,2) \rightarrow C'(-5,2)$

7. (x,y)→(-y, -x) Reflection across y = -x A'(3, -6), B'(1, 3), and C'(-2, -5)

$A(6,-3) \rightarrow A'(3,-6), B(-3,-1) \rightarrow B'(1,3), C(5,2) \rightarrow C'(-2,-5)$

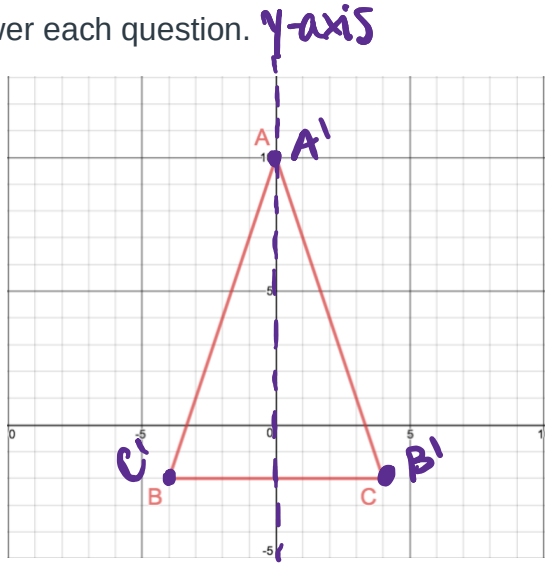
8. (x,y)→(y, x) Reflection across y = x A'(-3, 6), B'(-1, -3), and C'(2, 5)

$A(6,-3) \rightarrow A'(-3,6), B(-3,-1) \rightarrow B'(-1,-3), C(5,2) \rightarrow C'(2,5)$

9. (x,y)→(x, -y) Reflection across the x - axis A'(6, 3), B'(-3, 1), and C'(5, -2)

$A(6,-3) \rightarrow A'(6,3),\ B(-3,-1) \rightarrow B'(-3,1),\ C(5,2) \rightarrow C'(5,-2)$

Use the figure below to answer each question.



10. Reflect ΔABC across the y-axis. The graph will look the same with B mapping to C and vice versa.

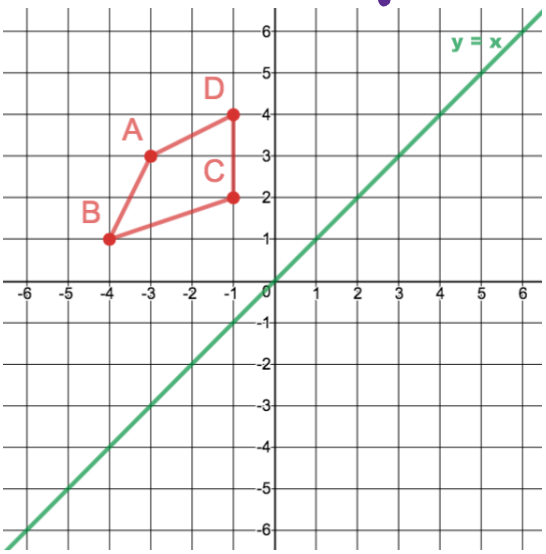
$A(0,10) \rightarrow A'(0,10)$
$B(-4,-2) \rightarrow B'(4,-2)$
$C(4,-2) \rightarrow C'(-4,-2)$

11. Reflectional symmetry is when a figure is reflected across a line and the image looks identical to the preimage. Are there any more lines of symmetry associated with ΔABC?

This triangle has reflectional symmetry across the y-axis only.

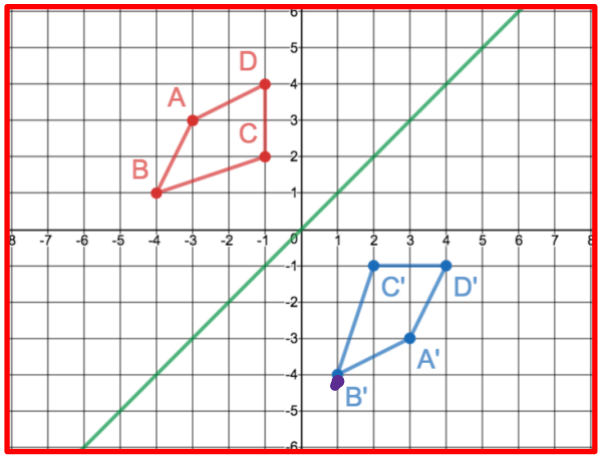
no other lines of reflection will create an identical image

Use the figure below to answer each question.



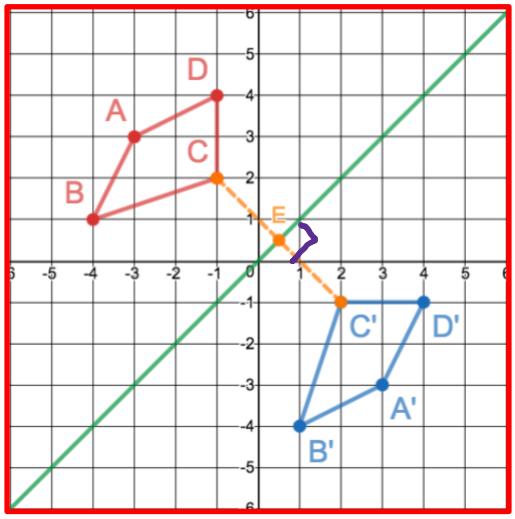
$(x,y) \rightarrow (y,x)$

12. Reflect vertex C across the line y = x.



$A(-3,3) \rightarrow A'(3,-3)$
$B(-4,1) \rightarrow B'(1,-4)$
$C(-1,2) \rightarrow C'(2,-1)$
$D(-1,4) \rightarrow D'(4,-1)$

13. Draw a line connecting C to C' and label the intersection of this line with y = x as point E.



$CE = C'E$

this means that pt. E created a segment bisector meaning the line CC' is cut in half.

14. A **perpendicular bisector** divides a segment into two equal parts and is perpendicular to the segment. In this case, y = x can be described as the perpendicular bisector of segment CC'. Verify that y = x will be the perpendicular bisector of segment BB' under the same reflection.

→ forms of right angle

The same properties apply to BB' or DD' or AA'