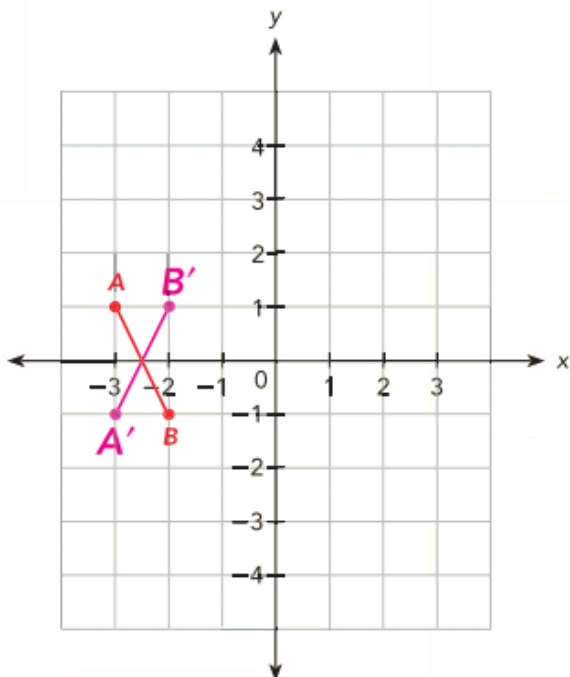


Practice 8.2

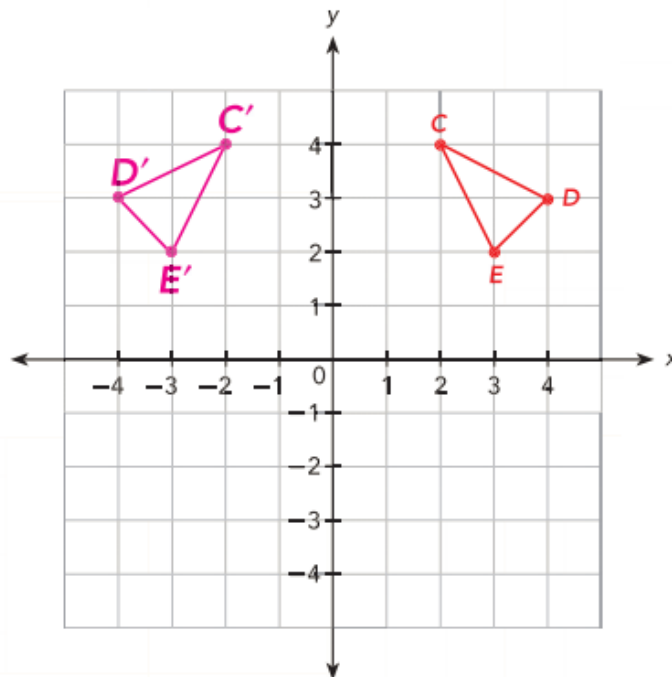
Basic 1 – 4
Intermediate 5 – 7
Advanced 8 – 9

Copy each diagram on graph paper, and draw and label the image using the given reflection.

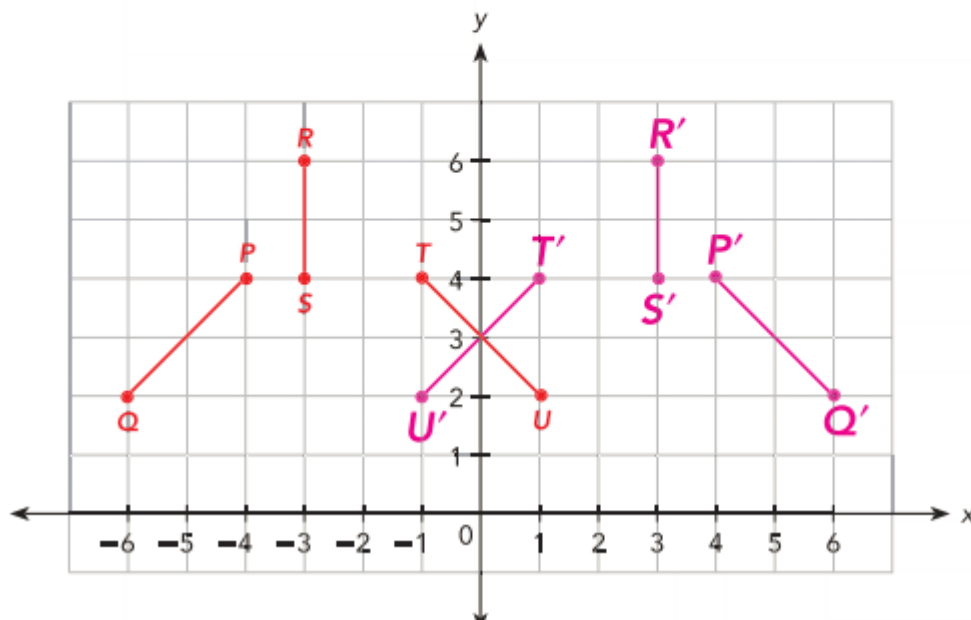
1 In the x -axis



2 In the y -axis



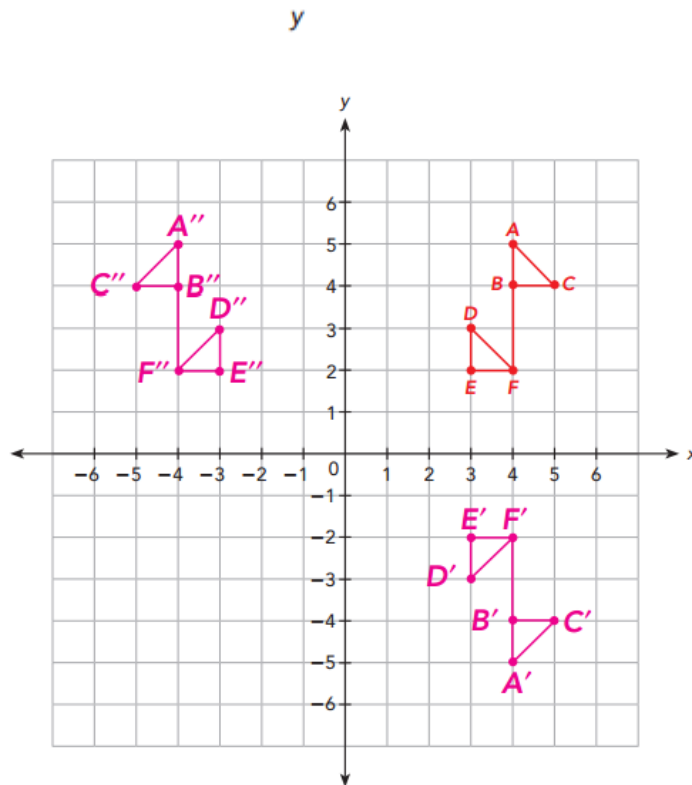
3 Ethan placed six sticks on a table. Three of the sticks, \overline{PQ} , \overline{RS} , and \overline{TU} are shown on the coordinate plane. The other sticks are images of the three sticks, with $x = 0$ as the line of reflection. On a copy of the graph, draw and label the sticks not shown on the coordinate plane.



- 4 A pattern is drawn on the coordinate plane and then repeated by first reflecting it in the x -axis and reflecting the original pattern in the y -axis.

- a) Copy and complete the table by finding the position of each of the other tiles. On a copy of the coordinate plane, indicate the positions of the images.

Locations	Reflection in the x -axis	Reflection in the y -axis
A (4, 5)	A' ? (4, -5)	A'' ? (-4, 5)
B (4, 4)	B' ? (4, -4)	B'' ? (-4, 4)
C (5, 4)	C' ? (5, -4)	C'' ? (-5, 4)
D (3, 3)	D' ? (3, -3)	D'' ? (-3, 3)
E (3, 2)	E' ? (3, -2)	E'' ? (-3, 2)
F (4, 2)	F' ? (4, -2)	F'' ? (-4, 2)



- b) Reflect A' , B' , and C' in the y -axis. What are the coordinates of the image?
 The coordinates are (-4, -5), (-4, -4), and (-5, -4).

- c) Reflect A'' , B'' , and C'' in the x -axis. What are the coordinates of the image? How do these coordinates compare to those in b)?

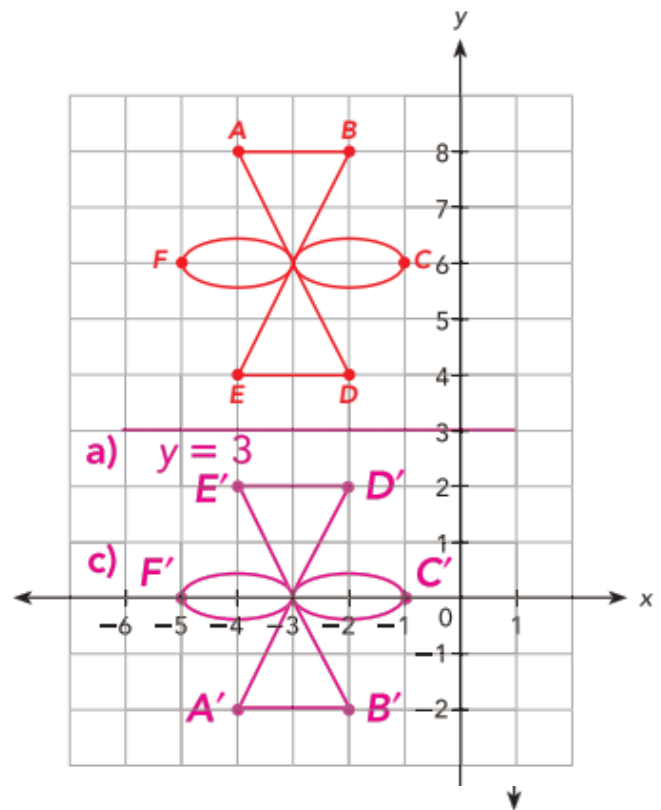
The coordinates are (-4, -5), (-4, -4), and (-5, -4); They are the same.

Copy and complete on graph paper.

- 5** Isabella painted a water color design on graph paper. Some of the points were at $A(-4, 8)$, $B(-2, 8)$, $C(-1, 6)$, $D(-2, 4)$, $E(-4, 4)$, and $F(-5, 6)$. She folded the paper along $y = 3$ to reflect the design. The image points are A' , B' , C' , D' , E' , and F' .

- a) Draw the line $y = 3$.
 b) Find the coordinates of A' , B' , C' , D' , E' , and F' .
 See below.
 c) Draw the image and label A' , B' , C' , D' , E' , and F' .


- b) $A'(-4, -2)$, $B'(-2, -2)$, $C'(-1, 0)$,
 $D'(-2, 2)$, $E'(-4, 2)$, $F'(-5, 0)$



Solve.

- 6** The image of a butterfly with its wings symmetrically spread out is outlined on the coordinate plane. The uppermost tips of the wings are at $(4, 5)$ and $(-2, 5)$. The lowermost tip of one wing is at $(2, 0)$.

- a) Find an equation of the line of reflection. $x = 1$
 b) Find the position of the lower tip of the other wing. $(0, 0)$

- 7**  **Math Journal** Point A' is the image of point A under a reflection. How do you find the line of reflection, without the use of a coordinate plane?

Construct the perpendicular bisector of $\overline{AA'}$

- 8** A tablecloth has two red dots on it. They are at positions $(-3, -1)$ and $(-1, -3)$. The cloth is folded in half, so that the dots touch each other. What is an equation for the line along which the tablecloth was folded? $y = x$

- 9** A leaf is symmetric about its midvein, the central vein that runs the length of the leaf. The leaf is outlined in the coordinate plane with its midvein on the line $y = -x$.

- a) A side vein has a length of 6 units on the grid. What is the length of its symmetric counterpart? **6 units**
 b) The endpoint of another side vein is at $(4, 3)$. What is the endpoint of its symmetric counterpart? **$(-3, -4)$**