

Guided Practice

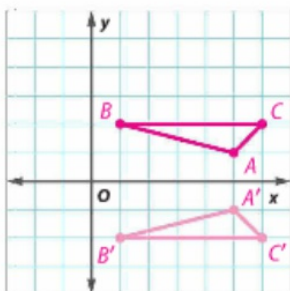


1. Graph $\triangle ABC$ with vertices $A(5, 1)$, $B(1, 2)$, and $C(6, 2)$ and its reflection over the x -axis. Then find the coordinates of the image.

(Examples 1 and 2)

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

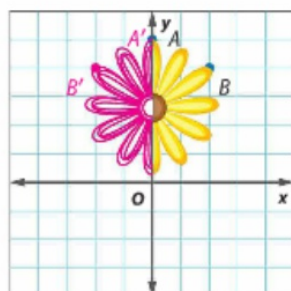
Show your work.



2. The figure is reflected over the y -axis. Find the coordinates of point A' and point B' . Then sketch the image on the coordinate plane.

(Example 3)

$A'(0, 5)$, $B'(-2, 4)$



3. **Building on the Essential Question** How can you determine the coordinates of a figure after a reflection over either axis?

Sample answer: If you reflect over the x -axis, keep the x -coordinate and take the opposite of the y -coordinate.

If you reflect over the y -axis, take the opposite of the x -coordinate and keep the y -coordinate.

Rate Yourself!

How well do you understand reflections? Circle the image that applies.



Clear



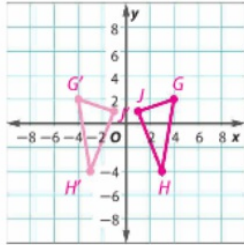
Somewhat Clear



Not So Clear

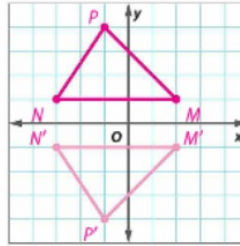
Graph each figure and its reflection over the indicated axis. Then find the coordinates of the reflected image. (Examples 1 and 2)

1. $\triangle GHJ$ with vertices $G(4, 2)$, $H(3, -4)$, and $J(1, 1)$ over the y -axis



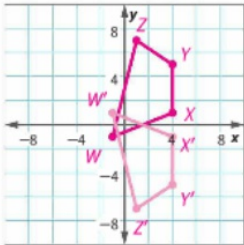
$G'(-4, 2)$, $H'(-3, -4)$, $J'(-1, 1)$

2. $\triangle MNP$ with vertices $M(2, 1)$, $N(-3, 1)$, and $P(-1, 4)$ over the x -axis



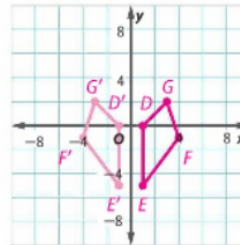
$M'(2, -1)$, $N'(-3, -1)$, $P'(-1, -4)$

3. quadrilateral $WXYZ$ with vertices $W(-1, -1)$, $X(4, 1)$, $Y(4, 5)$, and $Z(1, 7)$ over the x -axis



$W'(-1, 1)$, $X'(4, -1)$, $Y'(4, -5)$, $Z'(1, -7)$

4. quadrilateral $DEFG$ with vertices $D(1, 0)$, $E(1, -5)$, $F(4, -1)$, and $G(3, 2)$ over the y -axis

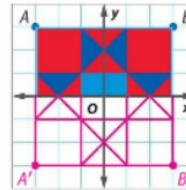


$D'(-1, 0)$, $E'(-1, -5)$, $F'(-4, -1)$, $G'(-3, 2)$

5. The figure at the right is reflected over the x -axis. Find the coordinates of point A' and point B' . Then sketch the image on the coordinate plane.

(Example 3)

$A'(-3, -3)$, $B'(3, -3)$



CCSS Identify Structure The coordinates of a point and its image after a reflection are given. Describe the reflection as over the x -axis or y -axis.

6. $A(-3, 5) \rightarrow A'(3, 5)$ y -axis

7. $M(3, 3) \rightarrow M'(3, -3)$ x -axis



H.O.T. Problems Higher Order Thinking

8. **CCSS Find the Error** Roberto is finding the coordinates of the image of a triangle with vertices $A(1, 1)$, $B(4, 1)$ and $C(1, 5)$ after a reflection over the x -axis. Describe his mistake and correct it.

Roberto reflected the triangle over the y -axis. The coordinates should be $A'(1, -1)$, $B'(4, -1)$ and $C'(1, -5)$.

The vertices of triangle $A' B' C'$ are $A'(-1, 1)$, $B'(-4, 1)$ and $C'(-1, 5)$.



9. **CCSS Persevere with Problems** Triangle JKL has vertices $J(-7, 4)$, $K(7, 1)$, and $L(2, -2)$. Without graphing, find the new coordinates of the vertices of the triangle after a reflection first over the x -axis and then over the y -axis. **$J''(7, -4)$, $K''(-7, -1)$, $L''(-2, 2)$**

10. **CCSS Reason Inductively** Suppose you reflect a triangle in Quadrant I over the y -axis, then translate the image 2 units left and 3 units down. Is there a single transformation that maps the preimage onto the image? Explain your reasoning. **no; Sample answer: If the vertices of $\triangle ABC$ are $A(1, 2)$, $B(3, 4)$, and $C(1, 4)$, then the vertices of the final image are $A''(-3, -1)$, $B''(-5, 1)$, and $C''(-3, 1)$.**

11. **CCSS Reason Inductively** Suppose you reflect a nonregular figure over the x -axis and then reflect it over the y -axis. Is there a single transformation using reflections or translations that maps the preimage onto the image? Explain your reasoning.

no; Sample answer: If the vertices of $\triangle ABC$ are $A(0, 0)$, $B(2, 2)$, and $C(0, 4)$, then the vertices of the final image are $A''(0, 0)$, $B''(-2, -2)$, and $C''(0, -4)$.

12. **CCSS Which One Doesn't Belong?** Triangle ABC has vertices $A(1, 2)$, $B(1, 5)$, and $C(4, 2)$ and undergoes a transformation. Circle the set of vertices that does not belong. Explain your reasoning.

$A'(1, -1)$, $B'(1, 2)$, $C'(4, -1)$

$A'(5, 2)$, $B'(5, 5)$, $C'(8, 2)$

$A'(1, -2)$, $B'(1, -5)$, $C'(4, -2)$

$A'(3, 3)$, $B'(3, 6)$, $C'(6, 3)$

Sample answer: This set is a reflection over the x -axis of $\triangle ABC$. The other sets are translations.