

Translations (Slide)

Key Idea

Reading

A' is read "A prime."
Use *prime* symbols
when naming
an image.

$A \rightarrow A'$
 $B \rightarrow B'$
 $C \rightarrow C'$

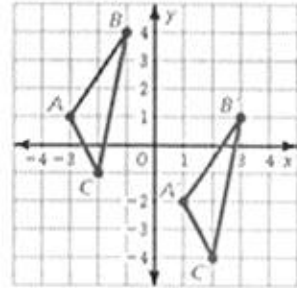
Translations in the Coordinate Plane

Words To translate a figure a units horizontally and b units vertically in a coordinate plane, add a to the x -coordinates and b to the y -coordinates of the vertices.

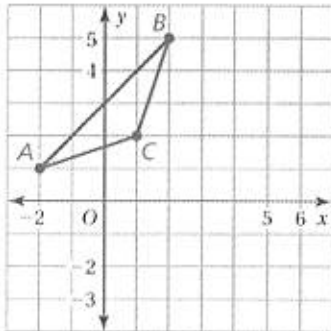
Positive values of a and b represent translations up and right. Negative values of a and b represent translations down and left.

Algebra $(x, y) \rightarrow (x + a, y + b)$

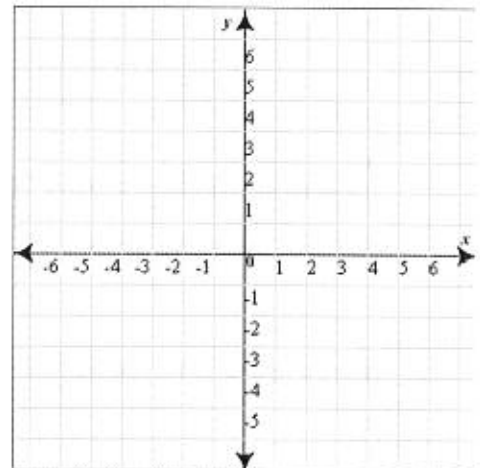
In a translation, the original figure and its image are congruent.



Translate the red triangle 3 units right and 3 units down. What are the coordinates of the image?



The vertices of a rectangle are $A(1, 4)$, $B(3, 4)$, $C(3, 1)$ and $D(1, 1)$. Draw the figure and its image after a translation 3 units left and 4 units down.

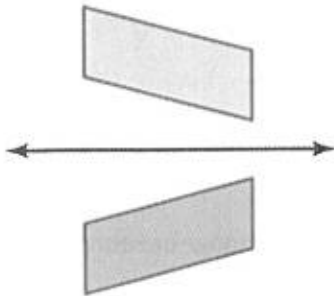


Reflections (Flip)

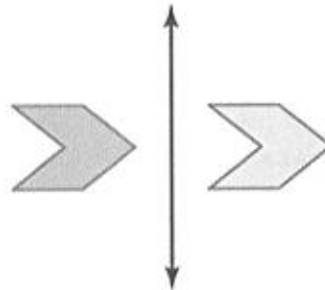
1 Identifying a Reflection

Tell whether the blue figure is a reflection of the red figure.

a.

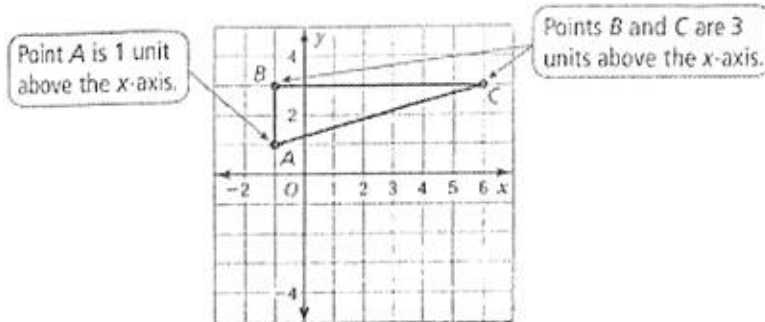


b.



EXAMPLE 2 Reflecting a Figure in the x-axis

The vertices of a triangle are $A(-1, 1)$, $B(-1, 3)$, and $C(6, 3)$. Draw the figure and its reflection in the x -axis. What are the coordinates of the image?



The original coordinates $A(-1, 1)$, $B(-1, 3)$ and $C(6, 3)$.

The new coordinates $A'(\quad, \quad)$, $B'(\quad, \quad)$ and $C'(\quad, \quad)$.

What changes from the original coordinates to the reflected coordinates?

EXAMPLE 3 Reflecting a Figure in the y -axis

The vertices of a quadrilateral are $P(-2, 5)$, $Q(-1, -1)$, $R(-4, 2)$, and $S(-4, 4)$. Draw the figure and its reflection in the y -axis.

Take the opposite of the x -coordinate.

The y -coordinate does not change.

Vertices of $PQRS$

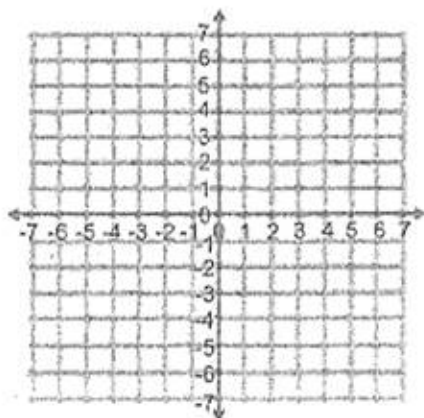
$(-x, y)$

$P(-2, 5)$

$Q(-1, -1)$

$R(-4, 2)$

$S(-4, 4)$

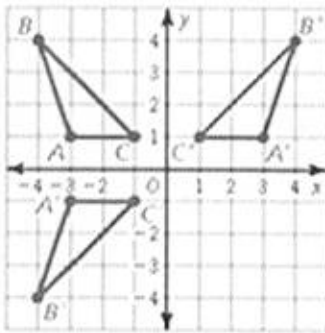
 **Key Idea****Reflections in the Coordinate Plane**

Words To reflect a figure in the x -axis, take the opposite of the y -coordinate.

To reflect a figure in the y -axis, take the opposite of the x -coordinate.

Algebra Reflection in x -axis: $(x, y) \rightarrow (x, -y)$

Reflection in y -axis: $(x, y) \rightarrow (-x, y)$



In a reflection, the original figure and its image are congruent.

