# 8.6 Graphing Translations and Reflections

## Quick Review

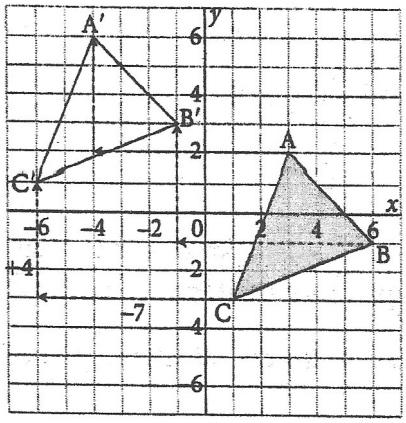
At Home
At School

➤ A translation moves a shape in a straight line.
The shape and its image are congruent, and have the same orientation.

When the shape is on a square grid, the translation is described by movements right or left and up or down.

$\triangle A'B'C'$ is the image of $\triangle ABC$ after a translation 7 units left and 4 units up.

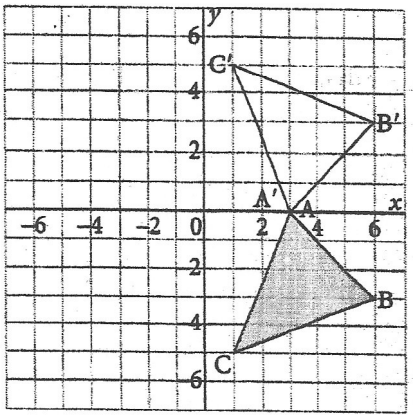
Both $\triangle ABC$ and its translation image $\triangle A'B'C'$ are read clockwise.

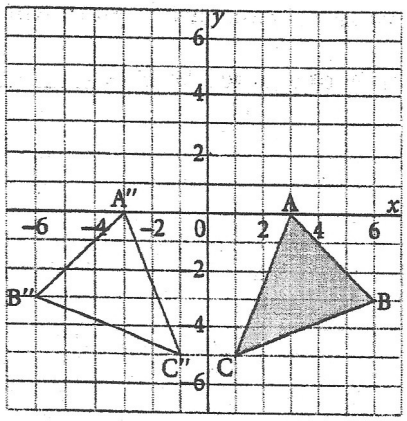



➤ A reflection creates a mirror image of a shape.
The mirror line is a line of symmetry for the shape and its image.

The shape and its image are congruent, but have different orientations.

$\triangle A'B'C'$ is the image of $\triangle ABC$ after a reflection in the $x$-axis.
$\triangle A''B''C''$ is the image of $\triangle ABC$ after a reflection in the $y$-axis.

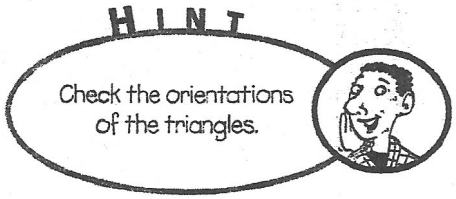


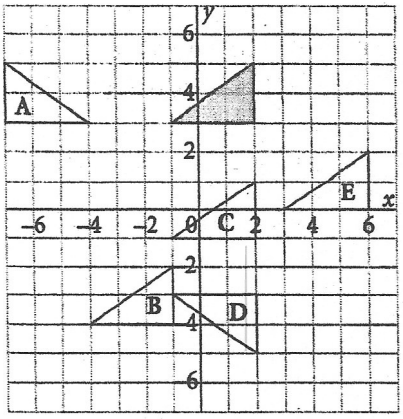




$\triangle ABC$ is read clockwise.
Its reflection images $\triangle A'B'C'$ and $\triangle A''B''C''$ are read counterclockwise.

## Practice

**1.** Which triangles are translation images of the shaded triangle? Which are reflection images?




Triangles _____ are translation images.

Triangles _____ are reflection images.

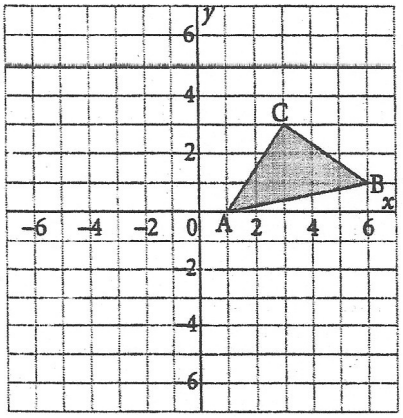
**2.** a) Draw the image of $\triangle ABC$ after a translation of 5 units left and 3 units up.

b) Write the coordinates of the vertices of $\triangle ABC$ and its image $\triangle A'B'C'$.

The image of A(1, 0) is A′(–4, 3).

The image of B(6, 1) is B′ _____

The image of C_____ is C′_____




c) For a translation 5 units left and 3 units up,

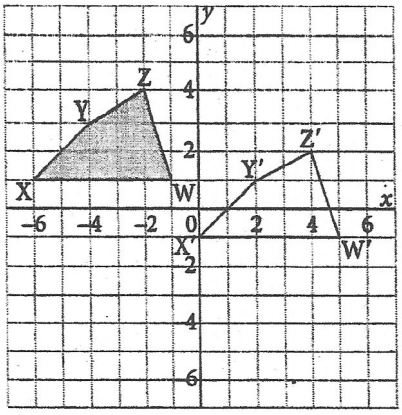
the $x$-coordinate _____ by 5,

and the $y$-coordinate _____ by 3.

**3.** Quadrilateral W′X′Y′Z′ is a translation image of quadrilateral WXYZ.

a) Describe the translation.

_____




b) Write the coordinates of the vertices of the quadrilateral and its image.

The image of W_____ is W′_____

The image of X _____ is X′_____

The image of Y _____ is Y′_____

The image of Z _____ is Z′_____

**4.** a) Draw the image of quadrilateral KLMN

- Draw a reflection on the $y$-axis. Label the image K'L'M'N'.
- after a reflection in the $x$-axis. Label the image K"L"M"N".

> **Tip**
> *To reflect a point, find its distance from the mirror line.*

b) Write the coordinates of the vertices of KLMN and its image K'L'M'N'.

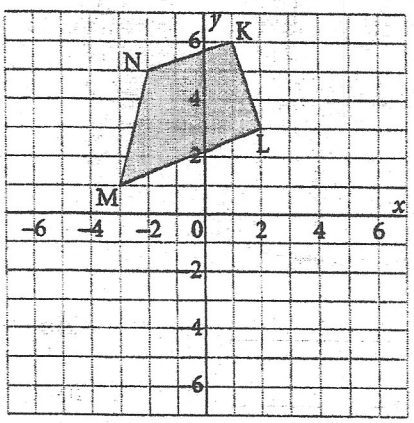



Image of K_____ is K'_____

Image of L_____ is L'_____

Image of M_____ is M'_____

Image of N_____ is N'_____

c) Write the coordinates of the vertices of KLMN and its image K"L"M"N".

K_____ K"_____ L_____ L"_____

M_____ M"_____ N_____ N"_____

d) Complete each statement about reflection.

When a point is reflected in the $y$-axis, its $y$-coordinate _____

and its $x$-coordinate _____.

When a point is reflected in the $x$-axis, its $x$-coordinate _____

and its $y$-coordinate _____.

**5.** a) Draw the image of $\triangle ABC$ after a reflection in the line through P(−3, −3), O(0, 0), and R(3, 3).

b) Write the coordinates of the vertices of $\triangle ABC$ and its image $\triangle A'B'C'$.

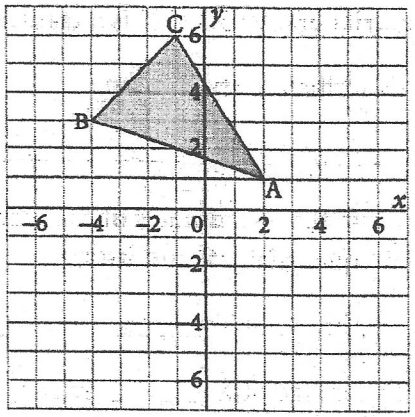



Image of A_____ is A'_____

Image of B_____ is B'_____

Image of C_____ is C'_____

c) What pattern do you see in the coordinates of each point and its image?

_____

_____