

5 TAKS PREPARATION



TAKS Obj. 7
TEKS 8.6.A-B

REVIEWING TRANSFORMATION PROBLEMS

Recall that three types of transformations are *translations*, *reflections*, and *dilations*.

Coordinate Notation for Transformations

A *translation* moves every point in a figure the same distance in the same direction.

Coordinate notation: $(x, y) \rightarrow (x + a, y + b)$

Example: $(x, y) \rightarrow (x + 1, y - 2)$ represents the translation “move each point 1 unit to the right and 2 units down.”

DILATIONS

In this book and on the TAKS, the origin of a coordinate plane is the center of dilation.

A *dilation* stretches or shrinks a figure with respect to a point.

Coordinate notation: $(x, y) \rightarrow (kx, ky)$ where k is the *scale factor* of the dilation. If $0 < k < 1$, the figure will *shrink*. If $k > 1$, the figure will *stretch*.

Example: $(x, y) \rightarrow (2x, 2y)$ stretches the figure by a scale factor of 2. The vertical and horizontal distance of each point from the origin doubles.

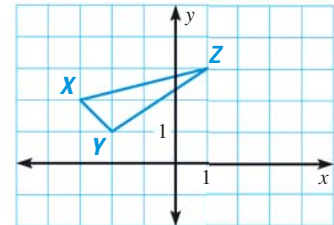
A *reflection* flips a figure across a line.

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

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

EXAMPLE

Find the coordinates of the vertices of the image of $\triangle XYZ$ reflected across the y -axis.



Solution

$\triangle XYZ$ has coordinates $X(-3, 2)$, $Y(-2, 1)$, and $Z(1, 3)$. To reflect $\triangle XYZ$ across the y -axis, multiply the x -coordinate of each vertex by -1 .

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

$$X(-3, 2) \rightarrow X'(3, 2)$$

$$Y(-2, 1) \rightarrow Y'(2, 1)$$

$$Z(1, 3) \rightarrow Z'(-1, 3)$$

► The coordinates are $X'(3, 2)$, $Y'(2, 1)$, and $Z'(-1, 3)$.

