

## Lesson 8-4

## Example 1

Begin with square  $PQRS$  with vertices  $P(3, -3)$ ,  $Q(6, -3)$ ,  $R(6, -6)$ , and  $S(3, -6)$ . First, perform a reflection over the  $x$ -axis ( $P'Q'R'S'$ ) followed by a dilation with center at the origin and a scale factor of  $\frac{1}{3}$  ( $P''Q''R''S''$ ).

## Solution

Start with square  $PQRS$ .

Use the rule  $(x, y) \rightarrow (x, -y)$ .

$$P(3, -3) \rightarrow P'(3, 3)$$

$$Q(6, -3) \rightarrow Q'(6, 3)$$

$$R(6, -6) \rightarrow R'(6, 6)$$

$$S(3, -6) \rightarrow S'(3, 6)$$

Then apply a dilation with center at the origin and a scale factor of  $\frac{1}{3}$  to square  $P'Q'R'S'$ .

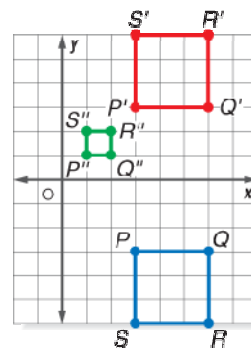
Use the rule  $(x, y) \rightarrow (\frac{1}{3}x, \frac{1}{3}y)$ .

$$P'(3, 3) \rightarrow P''(1, 1)$$

$$Q'(6, 3) \rightarrow Q''(2, 1)$$

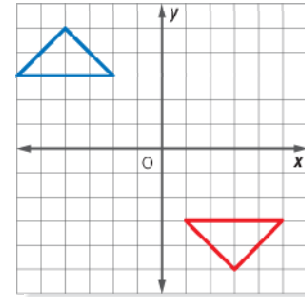
$$R'(6, 6) \rightarrow R''(2, 2)$$

$$S'(3, 6) \rightarrow S''(1, 2)$$



**Example 2**

**ENGINEERING** A ride designer is using a computer to map the movement of the car for a new amusement park ride. The two triangles at the right represent the car at beginning and end of a short section of track after two transformations. Describe these transformations.

**Solution**

Think of the triangle in Quadrant II as the preimage and the triangle in Quadrant IV as the image. Use what you know about transformations to identify the two transformations performed on the preimage.

The preimage has been moved over or slid in a horizontal direction for 7 units. The triangle was then reflected or flipped, across the  $x$ -axis.

