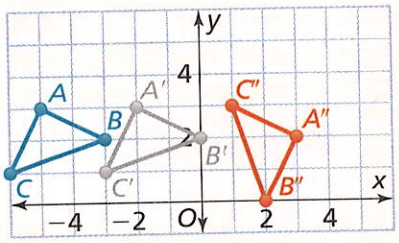
KEY CONCEPT

You can use a sequence of two or more transformations to map a preimage to its image.

You can map $\triangle ABC$ onto $\triangle A''B''C''$ by a translation 3 units right followed by a 90° clockwise rotation about the origin.



Do You Understand?

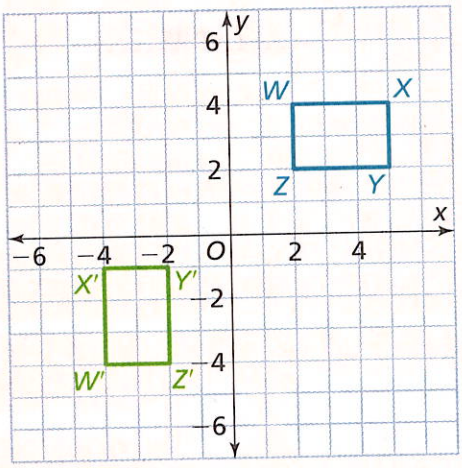
1. **Essential Question** How can you use a sequence of transformations to map a preimage to its image?

2. **Make Sense and Persevere** A preimage is rotated 180° about the origin and then rotated 180° about the origin again. Compare the preimage and image.

3. **Reasoning** A figure ABC, with vertices $A(2, 1)$, $B(7, 4)$, and $C(2, 7)$, is rotated 90° clockwise about the origin, and then reflected across the y-axis. Describe another sequence that would result in the same image.

Do You Know How?

In 4–6, use the diagram below.



4. Describe a sequence of transformations that maps rectangle $WXYZ$ onto rectangle $W'X'Y'Z'$.

5. Describe another way that you could map rectangle $WXYZ$ onto $W'X'Y'Z'$.

6. Draw the image of rectangle $WXYZ$ after a reflection across the line $y = 1$ and a translation 1 unit right. Label the image $W''X''Y''Z''$.

Name: _____

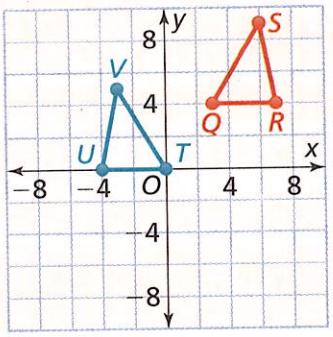
Practice & Problem Solving

Scan for Multimedia

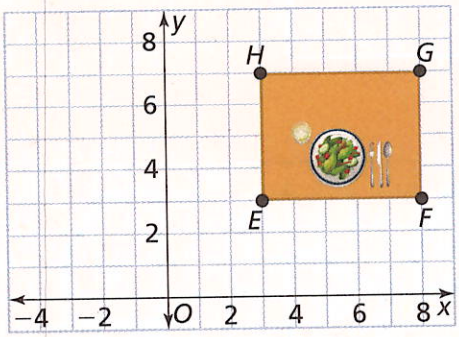
7. Leveled Practice Describe a sequence of transformations that maps $\triangle QRS$ onto $\triangle TUV$.

A translation ____ units left and ____ units down,

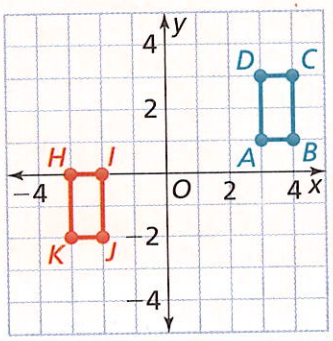
followed by a ____ across the ____.



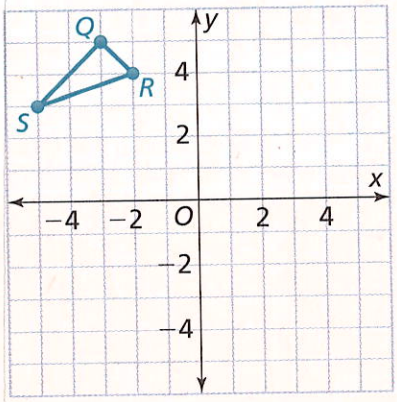
8. Model with Math A family moves a table, shown as rectangle *EFGH*, by translating it 3 units left and 3 units down followed by a 90° rotation about the origin. Graph $E'F'G'H'$ to show the new location of the table.



9. Describe a sequence of transformations that maps quadrilateral *ABCD* to quadrilateral *HIJK*.



10. Map $\triangle QRS$ to $\triangle Q'R'S'$ with a reflection across the *y*-axis followed by a translation 6 units down.



11. Higher Order Thinking A student says that he was rearranging furniture at home and he used a glide reflection to move a table with legs from one side of the room to the other. Will a glide reflection result in a functioning table? Explain.