

ACTIVITY 7.5

Developing Concepts

GROUP ACTIVITY

Work with a partner.

MATERIALS

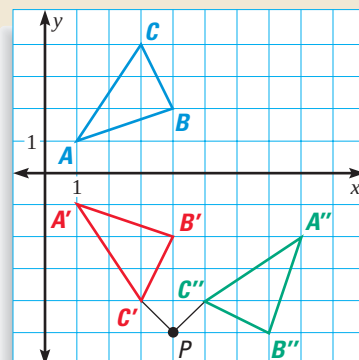
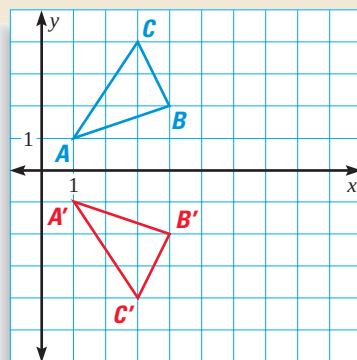
- graph paper
- ruler
- protractor
- compass

Group Activity for use with Lesson 7.5

Multiple Transformations

► **QUESTION** Does the order in which two transformations are performed affect the final image?

► EXPLORING THE CONCEPT



- 1 Draw $\triangle ABC$ with vertices $A(1, 1)$, $B(4, 2)$, and $C(3, 4)$. Reflect $\triangle ABC$ in the x -axis to obtain $\triangle A'B'C'$.
- 2 Rotate $\triangle A'B'C'$ 90° clockwise about $P(4, -5)$ to obtain $\triangle A''B''C''$.

► INVESTIGATE

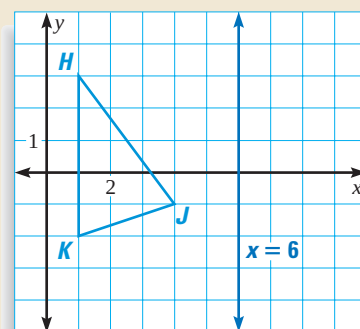
1. Name the coordinates of $\triangle A''B''C''$.
2. Repeat Steps 1 and 2, but switch the order of the transformations by performing the rotation first and the reflection second. Name the coordinates of $\triangle A''B''C''$.

► MAKE A CONJECTURE

3. Does the order in which transformations are completed affect the final image?

► INVESTIGATE

4. Copy $\triangle HJK$. Reflect $\triangle HJK$ in the line $x = 6$ to obtain $\triangle H'J'K'$. Then translate $\triangle H'J'K'$ using $(x, y) \rightarrow (x, y - 6)$ to obtain $\triangle H''J''K''$. Name the coordinates of $\triangle H''J''K''$.
5. Repeat Exercise 4, but switch the order of the transformations. Name the coordinates of $\triangle H''J''K''$ and compare them with the coordinates of $\triangle H''J''K''$ from Exercise 4. What do you notice?



EXTENSION

CRITICAL THINKING Use the Distance Formula to show that the transformation that maps $\triangle ABC$ onto $\triangle A''B''C''$ in Step 2 is an isometry.