ACTIVITY 7.3

Using Technology

Investigating Double Reflections

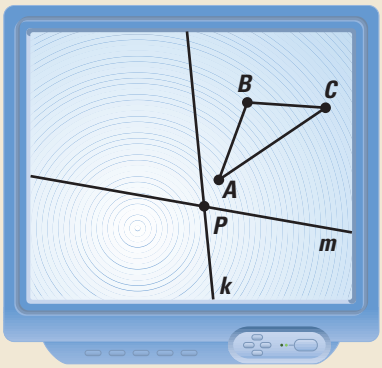
You can use geometry software to discover the type of transformation that results when a triangle is reflected twice in the plane.

STUDENT HELP

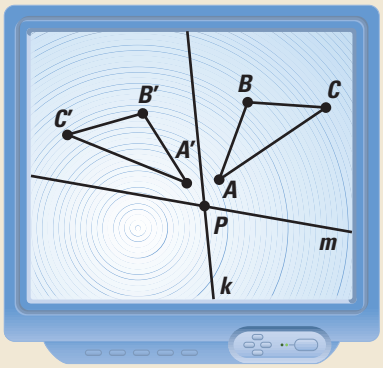
INTERNET SOFTWARE HELP

Visit our Web site www.mcdougallittell.com to see instructions for several software applications.

CONSTRUCT



1. Draw a scalene triangle similar to the one at the right. Label the vertices A, B, and C.
2. Draw two lines that intersect. Label the lines k and m. Make sure that the lines do not intersect the triangle.
3. Label the point of intersection of lines k and m as P.



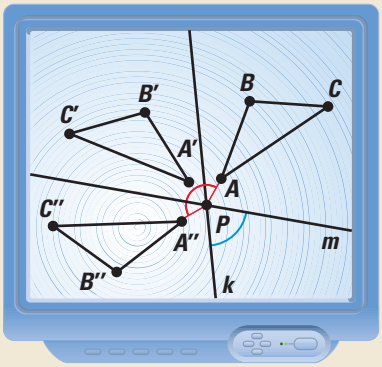
INVESTIGATE

1. Reflect $\triangle ABC$ in line k to obtain $\triangle A'B'C'$. Reflect $\triangle A'B'C'$ in line m to obtain $\triangle A''B''C''$. How is $\triangle ABC$ related to $\triangle A''B''C''$?

MAKE A CONJECTURE

2. What other transformation maps a figure onto the same image as a reflection in two intersecting lines?

INVESTIGATE



3. Draw segments connecting points A and P and points A'' and P. Measure $\angle APA''$. This angle is an example of an *angle of rotation*.
4. Measure the acute angle formed by lines k and m. Compare this measure to the measure of $\angle APA''$.
5. Find the measures of $\angle BPB''$ and $\angle CPC''$. What do you notice?

MAKE A CONJECTURE

6. In the reflection of a figure in two intersecting lines, what is the relationship between the acute angle formed by the two lines and the angle of rotation?

EXTENSION

Repeat **Steps 1–3** using a different scalene triangle. Is the conjecture that you made in Exercise 6 correct?