



# Transformations

Let's review rigid transformations.

## 8.1 Tile Transformations



1. Describe how you can get from Figure A to Figure A'.
2. Describe how you can get from Figure B to Figure B'.

## 8.2

## Card Sort: Name That Image

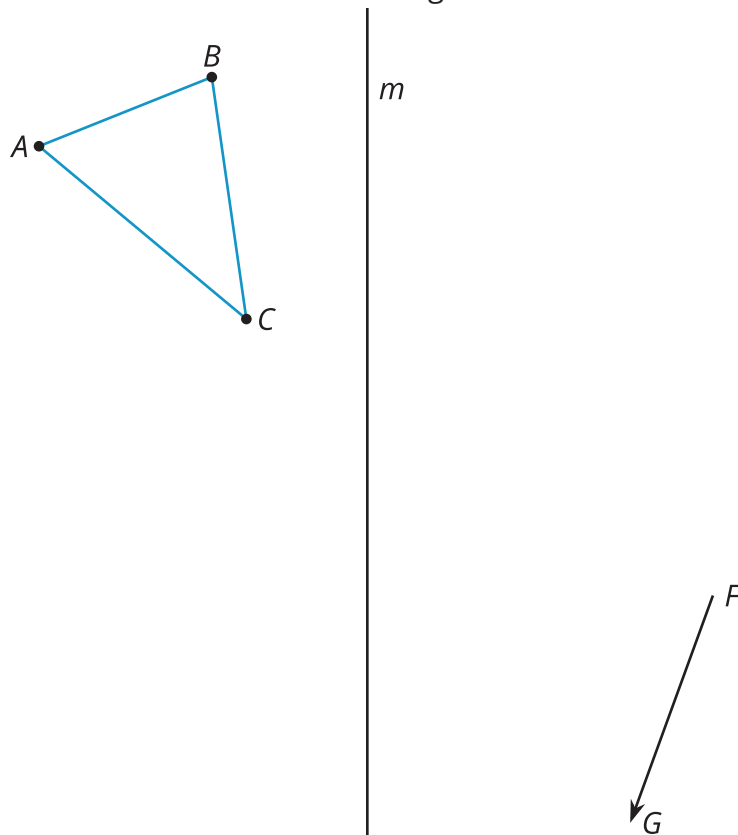
Your teacher will give you a set of cards. Take turns with your partner to match an image with a description of the transformation shown.

1. For each match that you find, explain to your partner how you know it's a match.
2. For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.

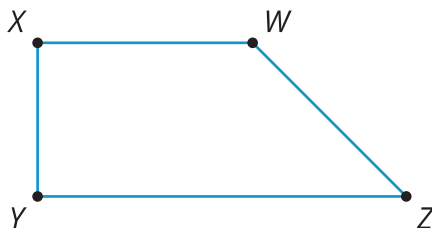
## 8.3 Where's the Triangle?

1. Perform the following transformations.

- Translate triangle  $ABC$  by directed line segment  $FG$ . Label the new image  $A'B'C'$ .
- Reflect  $A'B'C'$  over line  $m$ . Label the newest image  $A''B''C''$ .

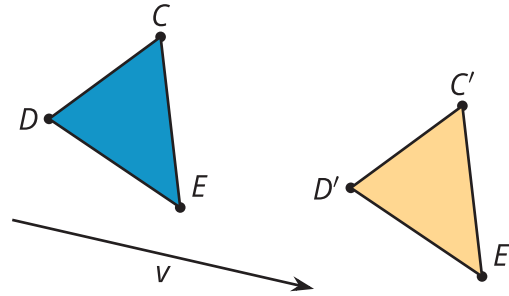


2. Rotate trapezoid  $WXYZ$  clockwise by the measure of angle  $YZW$ , using center  $Z$ .

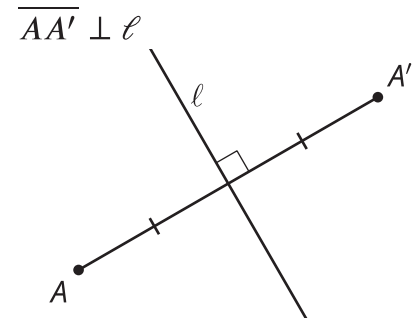


## Lesson 8 Summary

A translation slides a figure a given distance in a given direction. The distance and direction are given by a directed line segment. Here is a translation of 3 points. Notice the directed line segments  $CC'$ ,  $DD'$ , and  $EE'$  are each parallel to directed line segment  $v$ , go in the same direction as  $v$ , and are the same length as  $v$ .



We define a reflection across a line  $\ell$  as a transformation that takes each point  $A$  to a point  $A'$  as follows:  $A'$  lies on the line passing through  $A$  that is perpendicular to  $\ell$ , points  $A$  and  $A'$  are on opposite sides of line  $\ell$ , and points  $A'$  and  $A$  are the same distance from line  $\ell$ . If  $A$  happens to be on line  $\ell$ , then  $A$  and  $A'$  are both at the same location (they are both a distance of 0 from line  $\ell$ ).



A rotation is a transformation with a center, angle, and direction (clockwise or counterclockwise). Let's rotate a point  $P$  around a center point  $C$  in a counterclockwise direction by an angle that measures  $t$  degrees. This is how point  $P$  is transformed:

- The rotation takes point  $P$  to a point  $P'$  on a circle with a radius of length  $CP$ .
- $P$  rotates counterclockwise around the circle to end at  $P'$ .
- The angle  $PCP'$  measures  $t$  degrees.

$$\overline{PC} \cong \overline{P'C}$$

