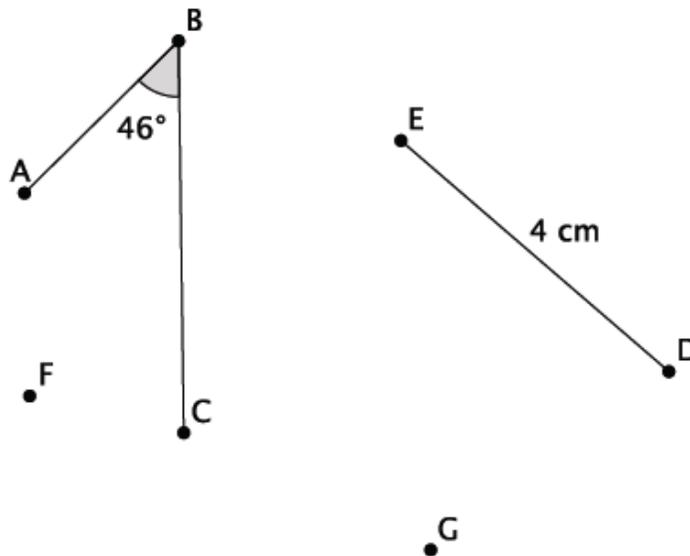


**Lesson Summary**

- Sequences of rotations have the same properties as a single rotation:
  - A sequence of rotations preserves degrees of measures of angles.
  - A sequence of rotations preserves lengths of segments.
- The order in which a sequence of rotations around different centers is performed matters with respect to the final location of the image of the figure that is rotated.
- The order in which a sequence of rotations around the same center is performed does not matter. The image of the figure will be in the same location.

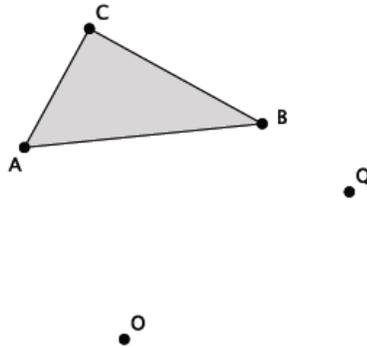
**Problem Set**

1. Refer to the figure below.



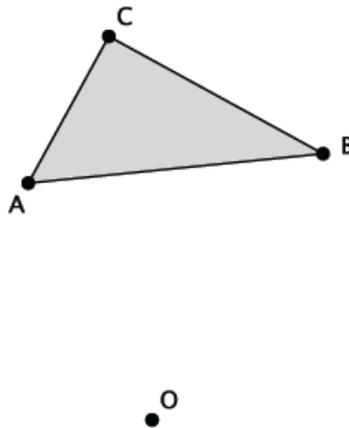
- a. Rotate  $\angle ABC$  and segment  $DE$   $d$  degrees around center  $F$  and then  $d$  degrees around center  $G$ . Label the final location of the images as  $\angle A'B'C'$  and segment  $D'E'$ .
- b. What is the size of  $\angle ABC$ , and how does it compare to the size of  $\angle A'B'C'$ ? Explain.
- c. What is the length of segment  $DE$ , and how does it compare to the length of segment  $D'E'$ ? Explain.

2. Refer to the figure given below.



- a. Let  $Rotation_1$  be a counterclockwise rotation of  $90^\circ$  around the center  $O$ . Let  $Rotation_2$  be a clockwise rotation of  $(-45)^\circ$  around the center  $Q$ . Determine the approximate location of  $Rotation_1(\triangle ABC)$  followed by  $Rotation_2$ . Label the image of  $\triangle ABC$  as  $\triangle A'B'C'$ .
- b. Describe the sequence of rigid motions that would map  $\triangle ABC$  onto  $\triangle A'B'C'$ .

3. Refer to the figure given below.



Let  $R$  be a rotation of  $(-90)^\circ$  around the center  $O$ . Let  $Rotation_2$  be a rotation of  $(-45)^\circ$  around the same center  $O$ . Determine the approximate location of  $Rotation_1(\triangle ABC)$  followed by  $Rotation_2(\triangle ABC)$ . Label the image of  $\triangle ABC$  as  $\triangle A'B'C'$ .