

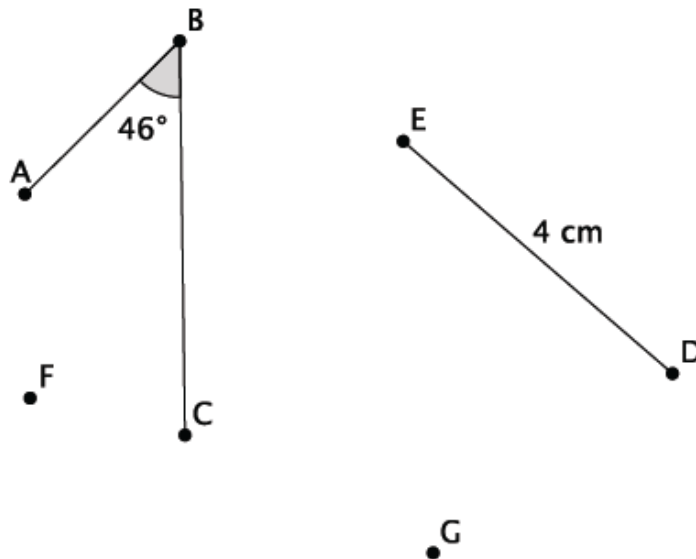
Lesson 9: Sequencing Rotations

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

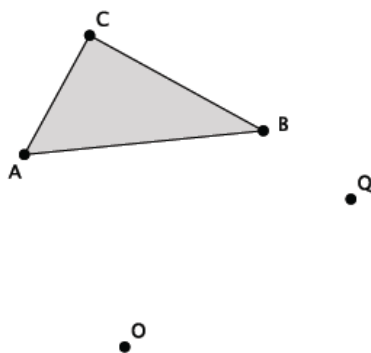
1. Refer to the figure below.



- 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 $D'E'$.

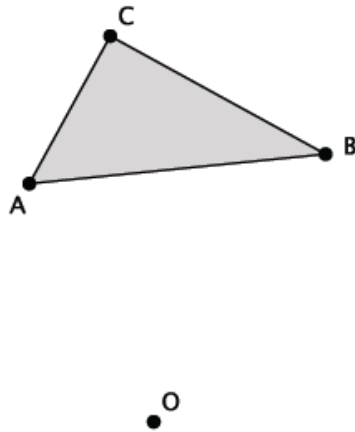
- b. What is the size of $\angle ABC$, and how does it compare to the size of $\angle A'B'C'$? Explain.
- c. What is the length of segment DE , and how does it compare to the length of segment $D'E'$? Explain.

2. Refer to the figure given below.



- a. Let $Rotation_1$ be a counterclockwise rotation of 90° 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 $\triangle A'B'C'$.