8.3.5 Lesson Date: _____

First Consequences of FTS

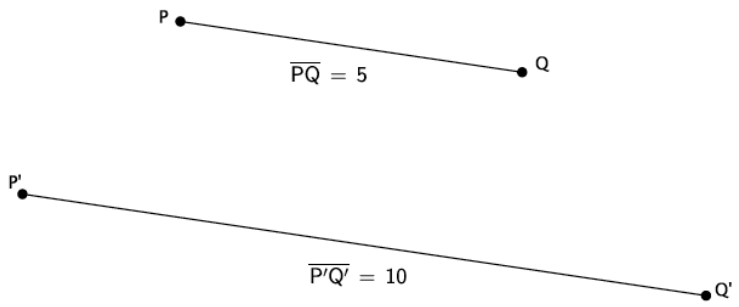
Student Objectives

- I can verify the converse of the Fundamental Theorem of Similarity experimentally.
- I can apply the Fundamental Theorem of Similarity to find the location of dilated points on the plane.

Classwork

Exercises

1. In the diagram below, points P and Q have been dilated from center O by scale factor r. $\overline{PQ} \parallel \overline{P'Q'}$, $m\overline{PQ} = 5$ cm, and $m\overline{P'Q'} = 10$ cm.

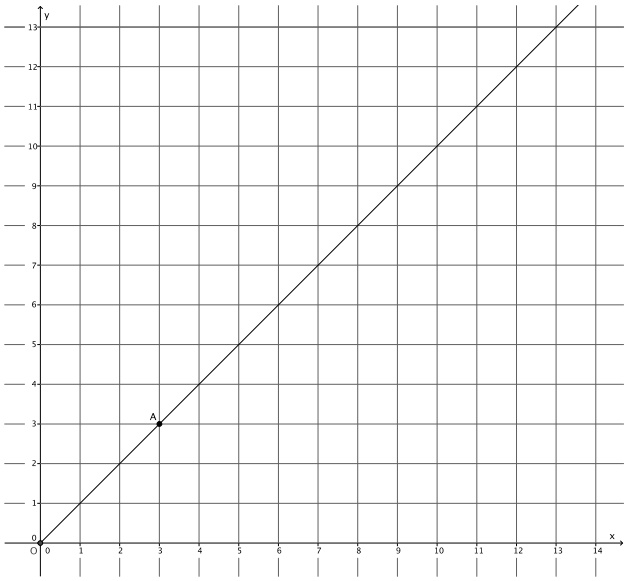


a. Determine the scale factor r.

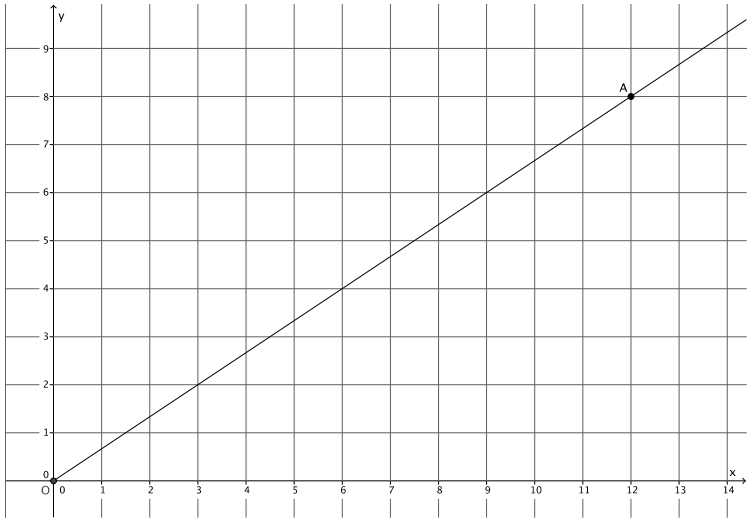
b. Locate the center O of dilation. Measure the segments to verify that $m\overline{OP'} = r * m\overline{OP}$ and $m\overline{OQ'} = r * m\overline{OQ}$. Show your work below.

Examples

1. In the diagram below, you are given center O and ray $\overrightarrow{OA}$. Point A is dilated by a scale factor $r = 4$. Use what you know about FTS to find the location of point A'.



2. In the diagram below, you are given center O and ray $\overrightarrow{OA}$. Point A is dilated by a scale factor $r = \frac{5}{12}$. Use what you know about FTS to find the location of point A'.



Lesson Summary

Converse of the Fundamental Theorem of Similarity:

If lines PQ and $P'Q'$ are parallel, and $m\overline{P'Q'} = r * m\overline{PQ}$, then there is a dilation of the plane by a scale factor of r about a point O.

To find the coordinates of a point dilated about the origin, multiply each coordinate by the scale factor.

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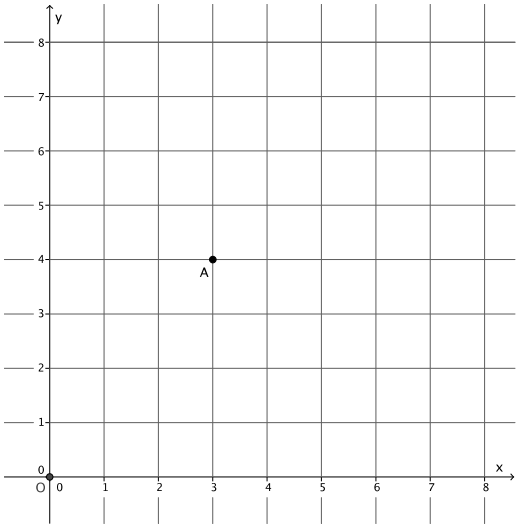
Homework Homework Homework Homework Homework

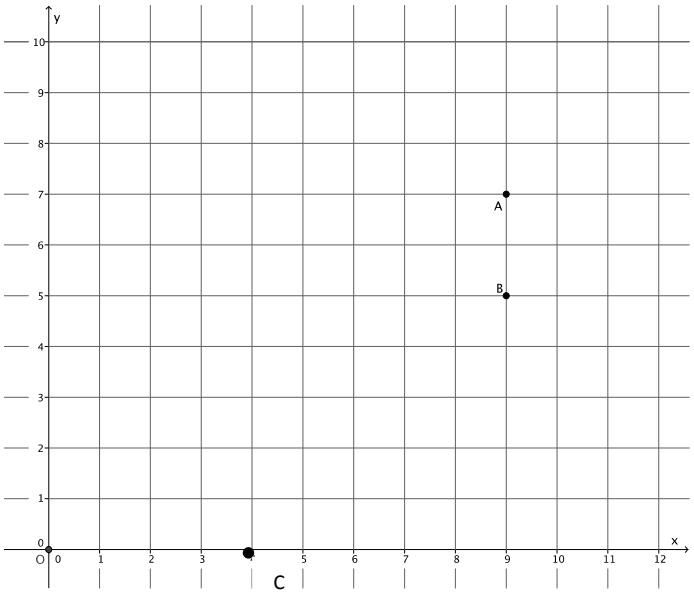
1. Dilate point A, located at $(3, 4)$ from center O, by a scale factor $r = \frac{5}{3}$.



What is the precise location of point A'?

2. Dilate point A, located at $(9, 7)$ from center O, by a scale factor $r = \frac{4}{9}$. Then dilate point B, located at $(9, 5)$ from center O, by a scale factor of $r = \frac{4}{9}$.

   a. What are the coordinates of $A'$and B'? Explain.



b. Name the relationship between $\angle ABB'$ **and** $\angle CB'B$ that tells you they are congruent.

3. Explain how you used the Fundamental Theorem of Similarity in problems 1 and 2.