Unit 2 Day 3 – More with Dilations

Example 1

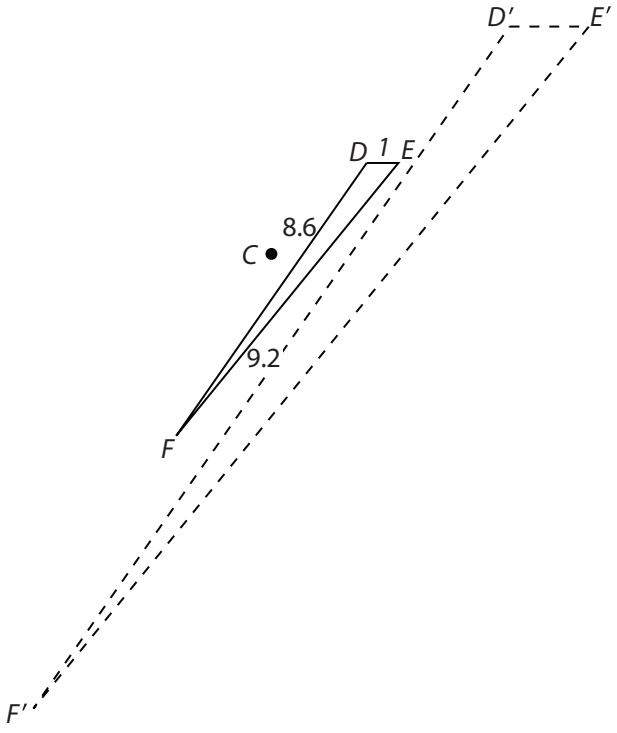
If $\overline{AB}$ has a length of 3 units and is dilated by a scale factor of 2.25, what is the length of $\overline{A'B'}$? Does this represent an enlargement or a reduction?

Example 2

A triangle has vertices G (2, –3), H (–6, 2), and J (0, 4). If the triangle is dilated by a scale factor of 0.5 through center C (0, 0), what are the image vertices? Draw the preimage and image on the coordinate plane.

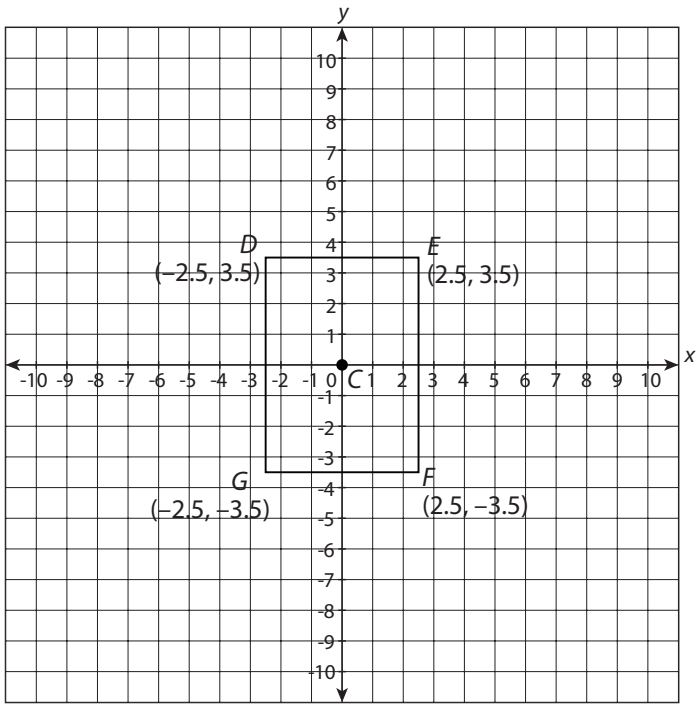
Example 3

What are the side lengths of $\triangle D'E'F'$ with a scale factor of 2.5 given the preimage and image below and the information that $DE = 1$, $EF = 9.2$, and $FD = 8.6$?



Problem-Based Task 1.1.2: The Bigger Picture

A photographer wants to enlarge a 5×7 picture to an 8×10. However, she wants to preserve the image as it appears in the 5×7 without distorting the picture. Distortions happen when the width and height of the photo are not enlarged at the same scale. How can the photographer dilate a 5×7 picture to an 8×10 picture without distorting the picture? Describe a process for enlarging the picture so that the image is a dilation of the preimage. Give the coordinates for the image vertices. The preimage is pictured below with the center C (0, 0).



Practice 1.1.2: Investigating Scale Factors

Determine the lengths of the dilated segments given the preimage length and the scale factor.

1. $\overline{AB}$ is 2.25 units long and the segment is dilated by a scale factor of $k = 3.2$.

2. $\overline{GH}$ is 15.3 units long and is dilated by a scale factor of $k = \frac{2}{3}$.

3. $\overline{ST}$ is 20.5 units long and is dilated by a scale factor of $k = 0.6$.

4. $\overline{DE}$ is 30 units long and is dilated by a scale factor of $k = \frac{2}{3}$.

Determine the image vertices of each dilation given a center and scale factor.

5. $\triangle HJK$ has the following vertices: H (–7, –3), J (–5, –6), and K (–6, –8). What are the vertices under a dilation with a center at (0, 0) and a scale factor of 3?

6. $\triangle PQR$ has the following vertices: P (–6, 4), Q (5, 9), and R (–3, –6). What are the vertices under a dilation with a center at (0, 0) and a scale factor of $\frac{1}{2}$?