Lesson Objective:
SWBAT determine whether a dilation is an enlargement, a reduction, or a congruence and they will be able to determine the scale factor for a given dilation.

A ____________ is a transformation that may change the size of a figure. A dilation requires a center point and a scale factor. Dilations can result in a larger figure or a smaller figure than the pre-image.

All of the transformations that we have studied so far in this unit produce images that are congruent to the pre-image. A dilation is another type of transformation where the size does NOT remain the same.

A __________________________ of magnitude a is defined by the following rule:

\[(x, y) \Rightarrow (ax, ay)\]

This means that the pre-image size is being altered by the same magnitude on all sides. The magnitude of the size transformation is the scale factor. It is the number you use to convert lengths in one figure to those in a similar figure.

Dilations/size transformations preserve angle measures, betweenness of points, and collinearity, but it does NOT preserve distance. This means that dilations produce ________________ not congruent figures.

**Graph the following points and find the image of each polygon after a dilation centered at the origin with a scale factor of 2.**

- A (1, 1)
- B (2, 3)
- C (4, 2)
- D (3, 1)
Graph the following points and find the image of the polygon after a dilation centered at the origin with a scale factor of 2.

Q (-1, -1)  
R (0, 2)  
S (2, 1)

If you know corresponding measurements for a pre-image and its dilation image, you can find the ___________.

**Scale factor** = \[
\frac{\text{image length}}{\text{pre-image length}}
\]

Determine the scale factor for each dilation with center C. Determine whether the dilation is an enlargement, reduction, or congruence transformation.

1. \(CGHJ\) is a dilation image of \(CDEF\).  
2. \(\triangle CKL\) is a dilation image of \(\triangle CKL\).
3. \(STUVWX\) is a dilation image of \(MNOPQR\).

4. \(\triangle CPQ\) is a dilation image of \(\triangle CYZ\).

5. \(\triangle EFG\) is a dilation image of \(\triangle ABC\).

6. \(\triangle HJK\) is a dilation image of \(\triangle HJK\).