**Dilations and Similarity**

**Properties of Dilation Investigation**

Dilate $∆ABC$ about the origin with a magnitude of 2. Graph the new triangle; label the vertices $A^{'}, B^{'}, \& C'$.

A

B

C



Complete the following using your dilation.

1. Compare the angles of $∆ABC$ and $∆A'B'C'$. What do you notice?
2. Using a ruler, find the lengths of $\overbar{AB}, \overbar{A^{'}B^{'}}, \overbar{AC}, \overbar{A^{'}C^{'}}, \overbar{BC},$ and $\overbar{B^{'}C^{'}}$. What do you notice?
3. Dilations create **similar figures**. Based on your observations from 1 and 2, what can we say about similar figures?
4. What do you notice about the placement of segments $\overbar{AB}$ and $\overbar{A^{'}B^{'}}$ on the coordinate plane? $\overbar{AC}$ and $\overbar{A^{'}C^{'}}$? Note that $A$ and $A'$ lie on the origin. What conclusion can you make about the segments of an image when the corresponding segments of the preimage pass through the center of dilation?
5. Compare the slopes of $BC$ and$\overbar{B^{'}C^{'}}$. What does that tell you about the relationship of the lines to one another? What conclusion can you make about the segments of an image when the corresponding segments of the preimage do not pass through the center of dilation?

**Checkpoint:**When a line segment passes through the center of dilation, the line segment and its image lie on the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.

When a line segment does not pass through the center of dilation, the line segment and its image are \_\_\_\_\_\_\_\_\_\_\_\_.

Dilations create figures that are always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to one another.

Two figures are similar (~) if they have the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_ but not necessarily the same \_\_\_\_\_\_\_\_\_\_\_\_.

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the ratio of the lengths of the corresponding sides.

 (a.k.a. the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Two figures are congruent   if they are similar and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Two polygons are similar if:

1) Corresponding \_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_ AND 2) Corresponding \_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_



**Checkpoint:**When a line segment passes through the center of dilation, the line segment and its image lie on the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.

When a line segment does not pass through the center of dilation, the line segment and its image are \_\_\_\_\_\_\_\_\_\_\_\_.

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Two polygons are similar if:

1) Corresponding \_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_ AND 2) Corresponding \_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_

