**Triangle Dilation Exploration**

**PART 1: DILATION EXPLORATION**

Use GSP to construct a random triangle, ABC.

**Use the dilation feature in the transform menu.**

What are the defining criteria for a dilation? i.e. what do you have to have selected and what other information do you have to give in order for GSP to allow you to use it. Note: These are the “givens” in your definition of a dilation. (Be sure to use a center point that is not part of your triangle.)

Note: There are two different ways to determine a scale of dilation using GSP: a fixed ratio and a marked ratio. We will eventually explore dilations using both. For now, just use a fixed ratio.

Name your new dilated triangle A’B’C’, where A’ corresponds to the original triangle’s vertex A, B’ corresponds to the original triangle’s vertex B, and C’ corresponds to the original triangle’s vertex C.

Use the table below to document some of your findings. Use some scale factors less than one and some greater than one.

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| --- | --- | --- | --- | --- | --- |
| Scale Factor | **Predict** the ratio of the sides of the image to the corresponding sides of the pre-image | Use GSP to Calculate the Ratio of the sides of the image to the preimage.Did it match your prediction? | Ratio of distance from point on the image to the center to distance from corresponding point on the pre-image to the center  | **Predict** the Ratio of Area of image to area of pre-image | Use GSP to calculate the Ratio of the areas (Image/preimage)Did it match your prediction?  |
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| 1 |  |  |  |  |  |

**PART 2: QUESTIONS**

How does the pre-image (triangle ABC) relate to the dilated image (triangle A’B’C’)?

What can you conclude about the ratios of the corresponding sides of the dilated image to the pre-image? How does it relate to the scale factor? What can you conclude about the ratio of the distance from points on the dilated image from the center to the distance of corresponding points on the pre-image to the center?

What can you conclude about the ratios of the areas of the dilated image to the area of the pre-image? i.e. How does it relate to the scale factor?

Use GSP to measure the angles of both the dilated image and the angles of the pre-image. What do you notice?

These triangles are called SIMILAR TRIANGLES. Based on your observations, write the definition of similar triangles.