**Activity 4.1.2 Dilation GeoGebra Investigation**

Open GeoGebra and create triangle *ABC*. Locate a point in the exterior of the triangle and name it *D.* From the transformations menu, select “Dilate from Point.” Select and then point *D*. Use a scale factor of 1.5 for your dilation when prompted.

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| --- | --- | --- |
| **Triangle Sides**  |  | **Triangle Angles** |

**Part I** - Using your GeoGebra sketch measure and record the following segments and angles. Note that GeoGebra will name the sides with lower case letters. You will have to measure the angles yourself.

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1. What do you notice about the corresponding lengths of the sides of the triangles?
2. What do you notice about the corresponding angles of the triangles?
3. Ask GeoGebra to calculate these ratios, by typing them into the input window

 a’/a = \_\_\_\_\_\_\_\_\_\_\_\_\_\_b’/b = \_\_\_\_\_\_\_\_\_\_\_\_\_\_c’/c = \_\_\_\_\_\_\_\_\_\_\_\_\_

 What do you notice?

1. Experiment with moving point *D* (center of dilation) around so it is on, inside and outside your pre-image . Are there any changes to the sides or angles of ∆*A’B’C’* ?
2. In earlier transformations (reflections, translations and rotations) we concluded that many characteristics were preserved – measures of angles and distance. Do dilations share these properties? What evidence do you have to justify your answer?

**Part II** – Use your GeoGebra sketch to answer the following questions.

Move point *D* (center of dilation) so that it is not on .



1. Use slope in the measurement tool to find the slope of each side in and the corresponding sides of

Slope of = Slope of =

Slope of = Slope of =

Slope of = Slope of =

1. What do you notice about the slopes of corresponding sides? Have we seen this property in any other transformation?
2. Using the slopes you have found, which pairs of lines are parallel?
3. Julian states “all Dilations must be Translations” why do you think he drew that conclusion and is he correct?

**Part III** – Use your GeoGebra sketch to answer the following questions.

1. Move your center of dilation to a vertex on the triangle? What do you notice about the location of the sides of the pre-image compared to the location of the sides of the image?

1. Miguel notices that when objects are dilated that the pre-image and image segments have the same slope. He concludes that the images of all line segments that have been dilated are parallel to the corresponding segments in the pre-image. His teacher says that is not always true. Explain who is correct.