**Activity 1.5.3a Composition –Two Rotations**

**Construction Steps**

1. Open a new GeoGebra file and set labeling to New Points Only.

**Hint: (Options/Labeling/New Points Only)**

|  |  |
| --- | --- |
| 1. Hide the algebra window and the axes.
 | **Macintosh HD:Users:phubeny:Desktop:Screen Shot 2015-03-14 at 6.56.26 AM.png** |
| 1. Use the **Polygon** tool and click on the graphics window to create $∆ABC$

**Hint: (Create Point *A*, then *B*, then *C*, then back to *A*)** |  |
| 1. Use the **Point** tool and click to the left of $∆ABC$ to create point *D.*
 |  |

 **(An example of a possible scenario is shown below)**

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**Exploration Steps and Comprehension Questions**

1. Using the **Rotate around Point** tool**,** rotate $∆ABC$ about point *D* by 120° counterclockwise to produce the image $∆A'B'C'$ .
2. **Choose two positive integers whose sum is 120**.

Record your integer values: $n\_{1}= \\_\\_\\_\\_\\_\\_ n\_{ 2 }= \\_\\_\\_\\_\\_\\_$

1. Again using the **Rotate around Point** tool, rotate $∆ABC$ counterclockwise around *D* by an angle measure equal to $n\_{1}.$
2. Again using the **Rotate around Point** tool, rotate **the figure that resulted from step c** counterclockwise around *D* by an angle measure equal to $n\_{2}$.
3. **Comment on any relationship you observe between the two smaller rotations and the larger rotation.**
4. Now experiment by rotating objects by different angle measurements and thenbymeasures of two smaller rotations that add to this angle, for example 240° with smaller rotations of 160°, and 80°, etc.

**Do the relationships that you commented on in part e hold true here?**