Name ______________________

Class ______________________

Problem 1 – Using Dilations

On page 1.3, measure one side and one angle of the triangle so that each person in your group measures a different side and angle. Put a point in the middle of the triangle and label it *C*.

Then use the **Dilation** tool make a new triangle by clicking on point *C*, the scale factor, and then $\triangle PQR$. Label this $\triangle XYZ$. Now measure the corresponding side and angle.

1. What were the measures of the angles and sides of the triangles? Compare this to the other students in your group.

$\triangle$*PQR angle* __________ $\triangle$*YZ angle* __________

$\triangle$*PQR side* __________ $\triangle$*XYZ side* __________

2. What do you notice about the two angles?

3. How do the lengths of the sides compare? Is this the result you were expecting? What did the other members of your group observe?

4. Now drag a vertex of $\triangle PQR$, do the relationships above remain the same?

5. Drag point *C*: Are the relationships preserved under this change? Compare your results to others in your group. Does it make any difference that each person may have constructed a different center point?

6. Complete the conjectures:

In a dilation, corresponding angles ____________________________________.

In a dilation, corresponding sides ____________________________________.

7. Change the scale factor to 3. Describe what happens to $\triangle XYZ$. Does this change the relationships you found above?

8. Now change the scale factor to 0.5. What happens to $\triangle XYZ$?

Problem 2 – Using A Negative Scale Factor

On page 2.2, measure the same side and angle from Problem 1. Use the **Dilation** tool to construct a new triangle, $\triangle XYZ$. Measure the corresponding side and angle.

9. Describe in words the result when a dilation is performed with a negative scale factor and center of dilation is outside of the triangle.

10. Do the properties that you noted in Problem 1 still hold true?

Problem 3 – Constructing with a Parallel Line

On page 3.3, place a point on $\overline{PQ}$ and label it *S*. Construct a parallel line to $\overline{QR}$ through point *S*. Find the intersection of the parallel line and side *PR*. Label it *T*. Hide the parallel line and construct $\overline{ST}$.

11. Explain why corresponding angles of $\triangle PST$ and $\triangle PQR$ are congruent.

12. Measure the sides of both triangles. Use the **Calculate** tool and the formula **A/B** to find the ratios of corresponding sides.

$\frac{PS}{PQ} =$ $\frac{PT}{PR} =$ $\frac{ST}{QR} =$

13. Drag point *S* to a new location and record the ratios again:

$\frac{PS}{PQ} =$ $\frac{PT}{PR} =$ $\frac{ST}{QR} =$

14. What relationship is true of corresponding sides of $\triangle PST$ and $\triangle PQR$? Does the location of point *S* affect this relationship?