Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How do circles and lengths of certain segments relate to each other?**

Directions: Use a ruler to draw the chords/secants/tangents as suggested below. You will be learning two new theorems or big ideas that relate circles and lengths of segments.

P

O

A

1. Using circle *A* above, choose four points on the circle. Draw two intersecting chords using the points as endpoints. (Look at the projector in front of the class for an example.)

Measure the lengths of the pieces of the chords and compute the products *w*·*x* and *y*·*z*. What do you notice?

2. Using the circle *O* above, choose two points *B* and *C* on the circle and a point *D* outside the circle. Draw secants $\overbar{\overbar{BD}}$ and $\overbar{CD}$. Label their intersections with the circle as *E* and *F*. (Look at the projector in front of the class for an example.)

Measure and compute *DE*·*DB* and *DF*·*DC*. What do you notice?

3. Using circle *P* above, choose three points *B*, *C*, and *D* on the circle. Draw a tangent to the circle through point *B* that intersects $\overleftrightarrow{CD}$ at a point *E*. (Look at the projector in front of the class for an example.)

Measure and compute $(BE)^{2}$ and *ED*·*CE*. What do you notice?

Based on your results, complete the following theorems:

9-11: When two chords intersect inside a circle, the \_\_\_\_\_\_\_\_\_\_\_ of the segments of one chord \_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_ of the segments of the other chord.

9-12: When two secant segments are drawn to a circle from an external point, the \_\_\_\_\_\_\_\_\_\_\_\_ of one secant segment and its external segment \_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_ of the other secant segment and its external segment.

9-13: When a secant segment and a tangent segment are drawn to a circle from an external point, the \_\_\_\_\_\_\_\_\_ of the secant segment and its external segment is \_\_\_\_\_\_\_\_\_\_\_\_ to the \_\_\_\_\_\_\_\_\_\_\_\_\_ of the tangent segment.

