Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Unit 6 – Lengths of Chords, Tangents and Secants**

Monica

Geometry Period:\_\_\_\_

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 1 Directions:** Today you are going to use GSP to explore the lengths of chords, tangents, and secants and the relationships between them. Follow the steps below and answer all of the questions.

**STEP 1:** Go to our class web site: tywlsgeometry.weebly.com and under the “Unit 6 – Circles” page, open the file under Day 6 called “Lengths of Chords, Tangents and Secants.”

**STEP 2:** There are 3 tabs at the bottom of the page named: Intersecting Chords, Tangent and Secant, and Two Secants. Click on the tab called “Intersecting Chords.”

**STEP 3:** Measure the length of the segments below and record the results. (To measure the length, select the two endpoints and choose “Distance” under the “Measure” menu.)

AE = \_\_\_\_\_\_\_\_\_\_\_ EB = \_\_\_\_\_\_\_\_\_\_\_\_ DE = \_\_\_\_\_\_\_\_\_\_\_\_ EC = \_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP 4:** Under the “Measure” menu select “Calculate”. Select the measurement you found for AE. Then select the multiplication key which is the \* symbol. Then select the measurement you found for EB. Hit “OK”. Repeat this process for the lengths of DE and EC. Record your results below. (Note: Ignore the units.)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**QUESTION #1:** What do you notice about the products of the pieces of the two chords? Draw an accompanying diagram. Drag different points around to change the measurements and observe that your conjecture is still true.

**STEP 5:** Click on the tab names “Tangent and Secant.”

**STEP 6:** Measure the length of the segments below and record the results. (To measure the length, select the two endpoints and choose “Distance” under the “Measure” menu.)

AB = \_\_\_\_\_\_\_\_\_\_\_ BD = \_\_\_\_\_\_\_\_\_\_\_\_ BC = \_\_\_\_\_\_\_\_\_\_\_\_

**STEP 7:** Under the “Measure” menu select “Calculate”. Select the measurement you found for “AB”. Then select the multiplication key which is the \* symbol. Then select the measurement you found for AB, again. Hit “OK”. Repeat this process for the lengths of BD and BC. Record your results below. (Note: Ignore the units.)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**QUESTION #2:** What do you notice about the product of the tangent times itself, and the product of the secant and the external part of the secant? Draw an accompanying diagram. Drag different points around to change the measurements and observe that your conjecture is still true.

**STEP 8:** Click on the tab names “Two Secants.”

**STEP 9:** Measure the length of the segments below and record the results. (To measure the length, select the two endpoints and choose “Distance” under the “Measure” menu.)

AC = \_\_\_\_\_\_\_\_\_\_\_ BC = \_\_\_\_\_\_\_\_\_\_\_\_ EC = \_\_\_\_\_\_\_\_\_\_\_\_ DC = \_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP 10:** Under the “Measure” menu select “Calculate”. Select the measurement you found for “AC”. Then select the multiplication key which is the \* symbol. Then select the measurement you found for BC. Hit “OK”. Repeat process for the lengths of EC and DC. Record your results below. (Note: Ignore the units.)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**QUESTION #3:**  What do you notice about the product of the secants and their external pieces? Draw an accompanying diagram. Drag different points around to change the measurements and observe that your conjecture is still true.

**PART 2:** Using the information you found in the investigation, answer the questions below.

1) What is the value of *x* in the figure below?

2) What is the value of *x* in the figure below?





4) Determine the values of *x* and *y* in the figure below. (Hint: Find *y* first.)



3) What is the value of *x* in the figure below?

