Segments in Circles
SegmentsInCircles.tns

Name ________________________

Class ________________________

Problem 1 – Chords and Tangents

Open page 1.2 and draw a circle using the **Circle** tool from the Shapes menu. Follow your teacher's directions to draw two tangents to the circle that they intersect *outside* the circle, plot the intersection point, and measure the length of each tangent segment. Grab and drag the circle to change its size, and observe what happens to the length of the tangents.

- Make a statement about the lengths of two tangent segments to a circle with the same exterior point.

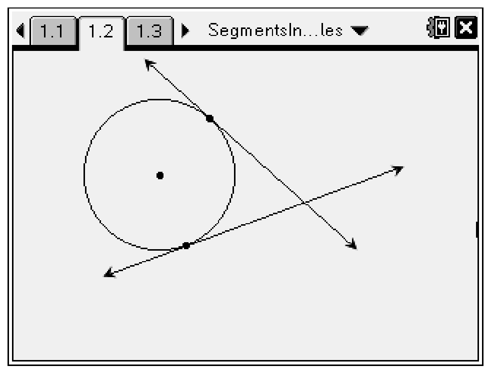
Listen to your teacher to find out how to use the gray formula cells in the spreadsheet to automatically capture the data and write/evaluate formulas.

- Make a conjecture about the relationship after you have collected your data.

Problem 2 – Intersecting Secants and Tangents

Draw a circle on page 2.1. Then draw a secant and a tangent to the circle so that they intersect outside the circle. Find the length of the following:

- the tangent segment ________
- the external secant segment ________
- the internal secant segment ________
- Make a conjecture about the relationship between these segments.



- Complete the following sentence:

  When a tangent and a secant intersect outside the circle, ________________________

  ____.

- Why do you think this theorem is sometimes called "outside squared = outside × whole"?

On page 2.4, draw a circle and two secants that intersect outside the circle. Measure the length of each of the four secant segments. Follow your teacher's instructions to store the lengths as variables, capture the data, and write/evaluate formulas.

- Complete the following sentence:

  When two secants intersect outside the circle, ________________________________

  ____.

- Why do you think this theorem is sometimes called “outside × whole = outside × whole”?

Problem 3 – Extension

Construct a circle, a radius, and a tangent to the circle such that the point of tangency is the intersection of the radius and circle. Find the measure of the angle that is formed. (You should change your settings to *Degree* mode. Ask your teacher if you need help.)

- Grab the point of tangency and drag it around the circle. What do you notice?

Now, construct a perpendicular to the radius. Plot the points of intersection of this line with the circle. Measure the lengths of each segment of the chord.

- Grab and drag the perpendicular across the length of the radius. What do you notice?

