

# Cabri Junior Investigation

## Exploring Tangents (Use with Lesson 10-5.)

A line that intersects a circle in exactly one point is called a **tangent** to the circle. You can use Cabri Junior to explore some of the characteristics of tangents. Use the following steps to draw two lines that are tangent to a circle.

**Step 1** Draw a circle.

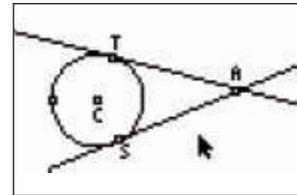
- Select **F2 Circle**.
- Place the cursor on the left center part of the screen and press **ENTER**. You have established the center of the circle.
- Press the left arrow to increase the radius length of the circle. Press **ENTER** when the circle has a desirable radius.
- Select **F5 Alph-num** to label the center of the circle  $C$ .

**Step 2** Place a point outside the circle.

- Select **F2 Point, Point**.
- Move the cursor outside the circle. Press **ENTER** to establish the point.
- Label the point  $A$ .

**Step 3** Draw a tangent line.

- Select **F2 Line**.
- Draw a line through point  $A$  that intersects circle  $C$  in exactly one point.
- Label the point  $T$ .



**Step 4** Draw a second tangent line.

- Repeat the procedure in Step 3 to draw another line through  $A$  that is tangent to circle  $C$ .
- Label the point  $S$ .

The lines drawn to the circle are tangents to the circle. *Note that these tangents are approximate, since it is difficult to find the exact point where the line touches the circle.*

### Exercises

Use the measuring capabilities of Cabri Jr. to explore the characteristics of tangents.

1. Measure  $\overline{AT}$  and  $\overline{AS}$ .
2. Move point  $A$  closer to the circle. (Press **CLEAR** so the pointer becomes a black arrow. Move the pointer close to point  $A$  until the arrow becomes transparent and point  $A$  is blinking. Press **ALPHA** to change the arrow to a hand. Then move the point.) Adjust  $\overline{AT}$  and  $\overline{AS}$  accordingly. Make a conjecture about the measurements of  $\overline{AT}$  and  $\overline{AS}$ .
3. Use the Segment tool to draw radii  $\overline{CT}$  and  $\overline{CS}$ . Measure  $\angle CTA$  and  $\angle CSA$ .
4. Make a conjecture about the angles formed by a radius and a tangent to a circle.