

## Activity 1

### Vertex on Circle—Secant and Tangent (Case 1a)

#### YOU WILL NEED

no special tools

#### CHECKPOINT ✓

#### TABLE PROOFS

As you justify each entry of the table for the general case, you are also proving a theorem.

#### CHECKPOINT ✓

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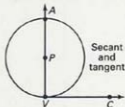
#### CHECKPOINT ✓

In this Activity, you will examine three configurations of secant-tangent angles.

1. The secant-tangent angle is a right angle.  
(The secant contains the center of the circle.)

$$m\angle AVC = \quad ? \quad m\widehat{AV} = \quad ?$$

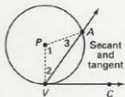
How does this relationship compare with the one between an inscribed angle and its intercepted arc?



$\angle AVC$  is a right angle.

2. The secant-tangent angle is acute.  
Copy and complete the following table:

$m\widehat{AV}$	$m\angle 1$	$m\angle 2$	$m\angle PVC$	$m\angle AVC$
$120^\circ$	$120^\circ$	$30^\circ$	?	$60^\circ$
$100^\circ$	?	?	?	?
$80^\circ$	?	?	?	?
$x^\circ$	?	?	?	?



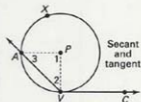
$\angle AVC$  is an acute angle.

Complete the following statement:

The measure of an acute secant-tangent angle with its vertex on a circle is      the measure of its intercepted arc.

3. The secant-tangent angle is obtuse.  
Copy and complete the following table:

$m\widehat{AXV}$	$m\angle 1$	$m\angle 2$	$m\angle PVC$	$m\angle AVC$
$200^\circ$	$160^\circ$	$10^\circ$	?	$100^\circ$
$220^\circ$	?	?	?	?
$240^\circ$	?	?	?	?
$x^\circ$	?	?	?	?



$\angle AVC$  is an obtuse angle.

Complete the following statement:

The measure of an obtuse secant-tangent angle with its vertex on a circle is      the measure of its intercepted arc.

4. Based on your results, complete the following theorem:

#### Theorem

If a tangent and a secant (or a chord) intersect on a circle at the point of tangency, then the measure of the angle formed is      the measure of its intercepted arc.

9.4.1