Problem 1 – Inscribed Angle Theorem

On page 1.3, you are given circle *D* with radius *AD*. Angle *ADB* is a central angle and ∠*ACB* is an inscribed angle.

1. Move point *A* to 2 different positions and point *C* to 2 different positions. Collect the data in the table. Calculate the ratios of $m\angle ACB$ to $m\angle ADB$ for each position. Record it in the table.

Position	Measure of ∠*ACB*	Measure of ∠*ADB*	$\frac{m\angle ACB}{m\angle ADB}$
1			
2			
3			
4			

2. Angles *ACB* and *ADB* are said to intercept the same arc ($\overset{\frown}{AB}$) because they go through the same points *A* and *B* on the circle. An inscribed angle in a circle is _____ the measure of the central angle that intercepts the same arc on the circle.

On page 1.6, you are given circle *D*. Angles *ACB* and *AEB* are inscribed angles and intercept the same arc.

3. Move point *A* to 2 different positions and move point *E* to 2 different positions. Collect the data in the table.

Position	Measure of ∠*ACB*	Measure of ∠*AEB*
1		
2		
3		
4		

4. Make a conjecture about two inscribed angles who intercept the same arc in a circle.

On page 1.9, you are given circle *D*. Use 1.9 to answer the following questions.

5. In circle *D*, what kind of segment is *AB*?

6. In circle *D*, what is $m\angle ACB$? (Hint: Use your answer to Exercise 4 to help you.).

Problem 2 – Extension of the Inscribed Angle Theorem

On page 2.2, you are given circle *D*, $\overset{\frown}{AB}$, and $\angle ACB$. Point *G* is a point on $\overset{\frown}{AB}$, $\angle ACB$ is an inscribed angle, and *AG* and *BG* are rays.

7. Move point *A* to 2 different positions and move point *G* to 2 different positions. Collect the data in the table.

Position	Measure of $\angle ACB$	Measure of $\angle ADB$	Measure of $\angle AGE$
1			
2			
3			
4			

8. Make a conjecture: The angle formed by the intersection of $\overrightarrow{AG}$ and $\overrightarrow{BG}$ is _____ the measure of the central angle *ADB*.

On page 2.5, you are given circle *D*, $\overset{\frown}{AB}$, and $\angle ACB$. Point *G* is a point on $\overset{\frown}{AB}$ and $\angle ACB$ is an inscribed angle. Also, you are given chord *AB* and a tangent line *BE*.

9. Move point *A* to 2 different positions and move point *B* to 2 different positions. Collect the data in the table.

Position	Measure of $\angle ACB$	Measure of $\angle ADB$	Measure of $\angle ABE$
1			
2			
3			
4			

10. Make a conjecture: The angle between a chord and the tangent line at one of its intersection points equals _____ of the central angle intercepted by the chord.