



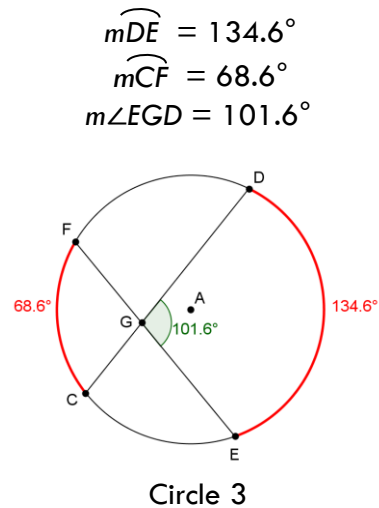
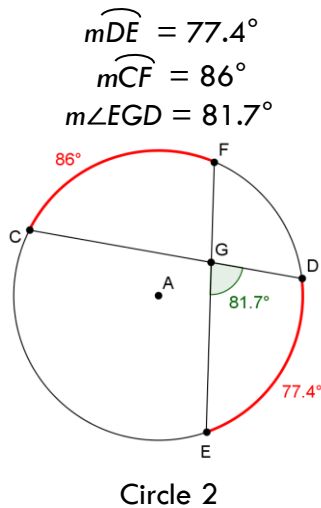
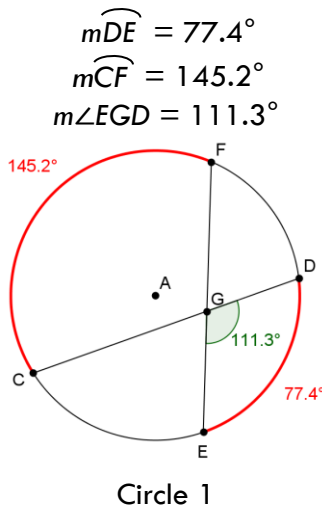
Angle Relationships in Circles

Elaborate

Directions: In each section below, compare the given information about arc measures or angle measures. Use your observations to complete the data table, and use the data table to answer the question that follows. Answer the debriefing questions.

Part 1: Angle formed by two intersecting chords

In circle A below, \overline{CD} and \overline{EF} are chords that intersect at point G. $\angle EGD$ intercepts \widehat{DE} , and its vertical angle, $\angle FGC$, intercepts \widehat{CF} .



Circle Number	1	2	3
$m\widehat{DE}$			
$m\widehat{CF}$			
$\frac{m\widehat{DE} + m\widehat{CF}}{2}$			
$m\angle EGD$			

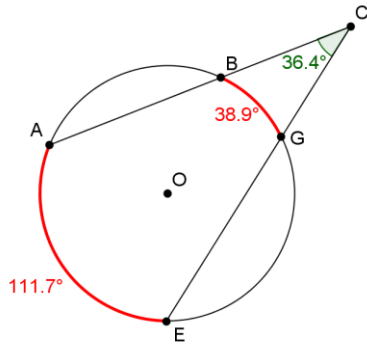
1. What is the relationship between an angle formed by two chords and their intercepted arcs?



Part 2: Angle formed by two intersecting secants

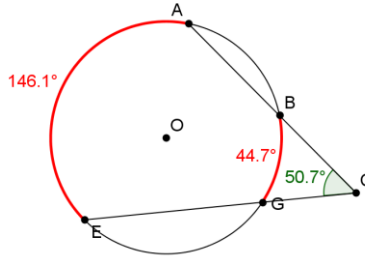
In circle O below, \overline{AC} and \overline{EC} are segments of secants \overline{AC} and \overline{EC} that intersect at point C, outside the circle. $\angle ACE$ intercepts \widehat{BG} and \widehat{AE} .

$$\begin{aligned} m\widehat{BG} &= 38.9^\circ \\ m\widehat{AE} &= 111.7^\circ \\ m\angle ACE &= 36.4^\circ \end{aligned}$$



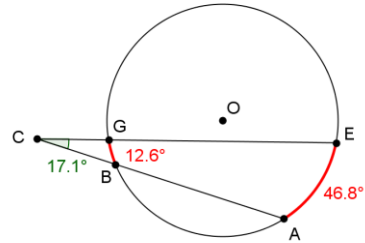
Circle 1

$$\begin{aligned} m\widehat{BG} &= 44.7^\circ \\ m\widehat{AE} &= 146.1^\circ \\ m\angle ACE &= 50.7^\circ \end{aligned}$$



Circle 2

$$\begin{aligned} m\widehat{BG} &= 12.6^\circ \\ m\widehat{AE} &= 46.8^\circ \\ m\angle ACE &= 17.1^\circ \end{aligned}$$



Circle 3

Circle Number	1	2	3
$m\widehat{BG}$			
$m\widehat{AE}$			
$\frac{m\widehat{AE} - m\widehat{BG}}{2}$			
$m\angle ACE$			

2. What is the relationship between an angle formed by two secants and their intercepted arcs?



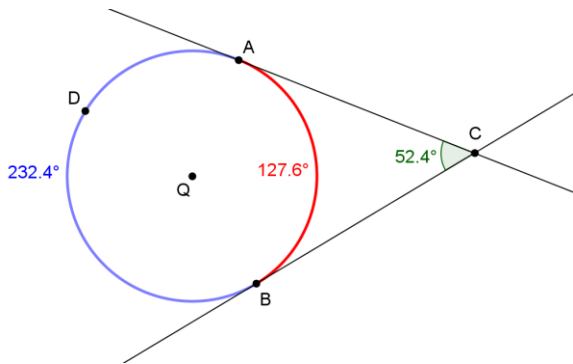
Part 3: Angle formed by two intersecting tangents

In circle Q below, \overline{AC} and \overline{BC} tangent lines that intersect at point C. $\angle ACB$ intercepts minor arc \widehat{AB} and major arc \widehat{ADB} .

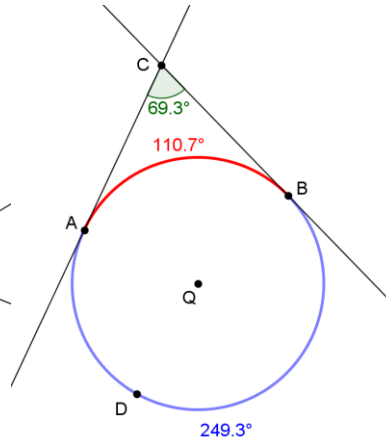
$$\begin{aligned} m\widehat{AB} &= 127.6^\circ \\ m\widehat{ADB} &= 232.4^\circ \\ m\angle ACB &= 52.4^\circ \end{aligned}$$

$$\begin{aligned} m\widehat{AB} &= 110.7^\circ \\ m\widehat{ADB} &= 249.3^\circ \\ m\angle ACB &= 69.3^\circ \end{aligned}$$

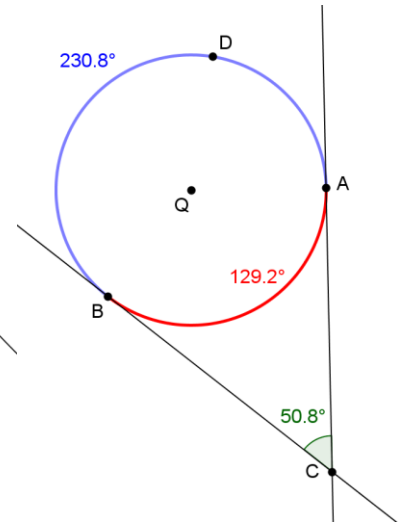
$$\begin{aligned} m\widehat{AB} &= 129.2^\circ \\ m\widehat{ADB} &= 230.8^\circ \\ m\angle ACB &= 50.8^\circ \end{aligned}$$



Circle 1



Circle 2



Circle 3

Circle Number	1	2	3
$m\widehat{AB}$			
$m\widehat{ADB}$			
$\frac{m\widehat{AB} - m\widehat{ADB}}{2}$			
$m\angle ACE$			

3. What is the relationship between an angle formed by two tangents and their intercepted arcs?



