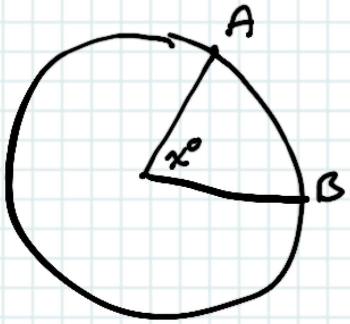
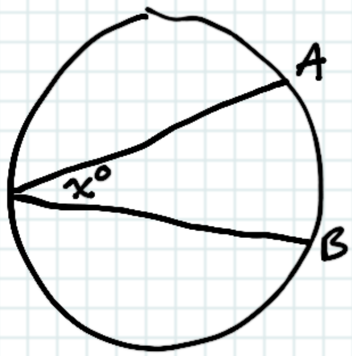
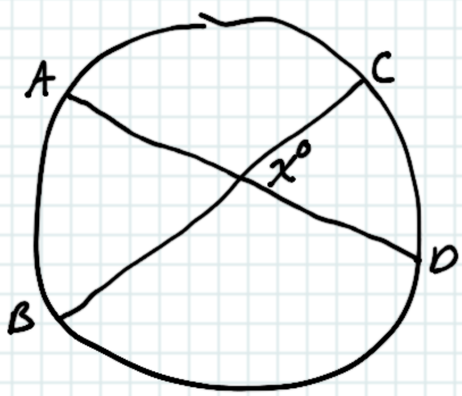
Geometry / Circles



Central angle, the angle is the same as arc measure $x = m\overset{\frown}{AB}$

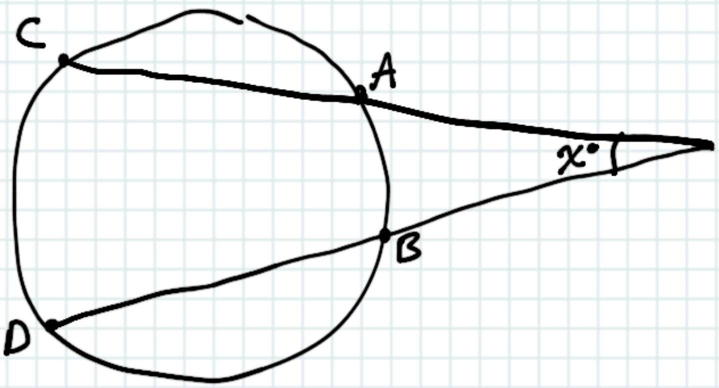


Inscribed angle, the angle is ½ the arc measure $x = \frac{1}{2} m\overset{\frown}{AB}$



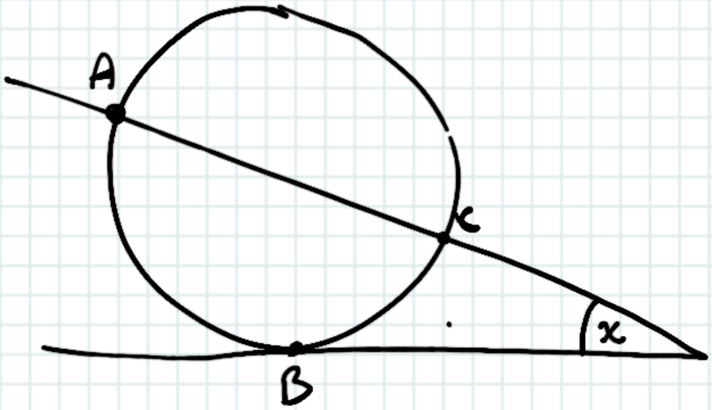
2 chords, the angle is the mean (average) of the 2 arc measures.

$$x = \frac{m\overset{\frown}{AB} + m\overset{\frown}{CD}}{2}$$



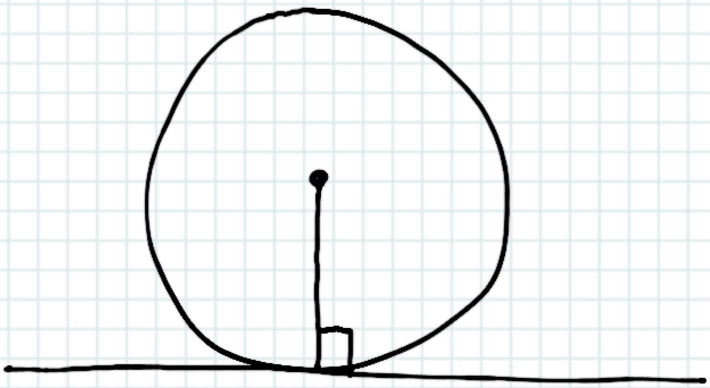
2 secant lines.
The angle is half the difference of the 2 arcs.

$$x = \frac{m\overset{\frown}{CD} - m\overset{\frown}{AB}}{2}$$

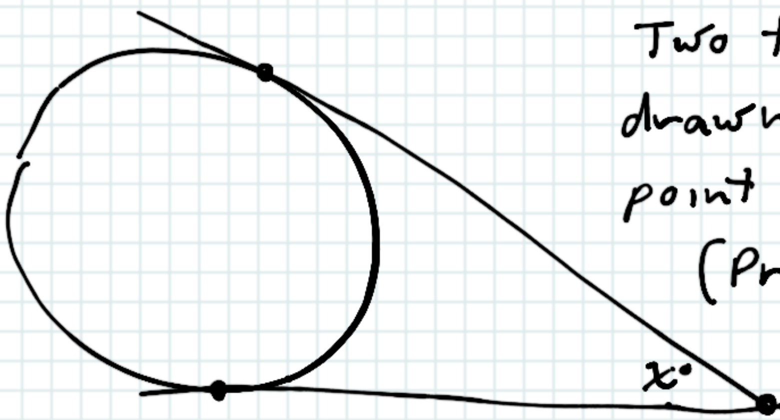


Secant-Tangent similar to prior case

$$x = \frac{m\overset{\frown}{AB} - m\overset{\frown}{BC}}{2}$$

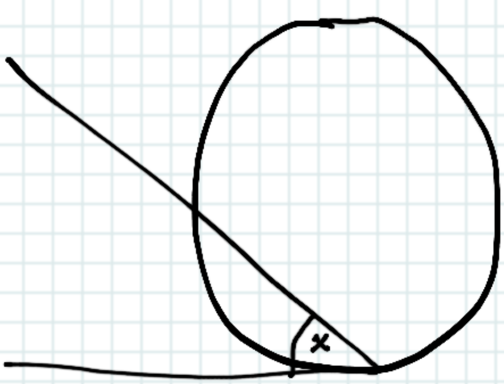


A line tangent to a circle is perpendicular to the radius it intersects.



Two tangent segments drawn from an external point are congruent.
(Proof via HL)

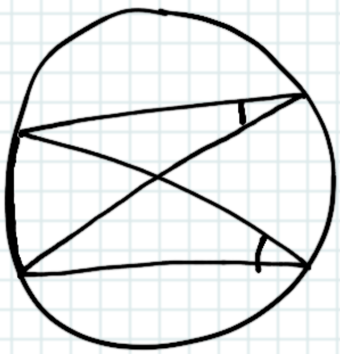
$$x = \frac{\text{major arc} - \text{minor arc}}{2}$$



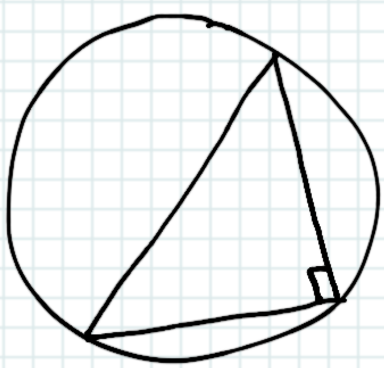
Tangent-Secant

$x = \frac{1}{2}$ arc measure

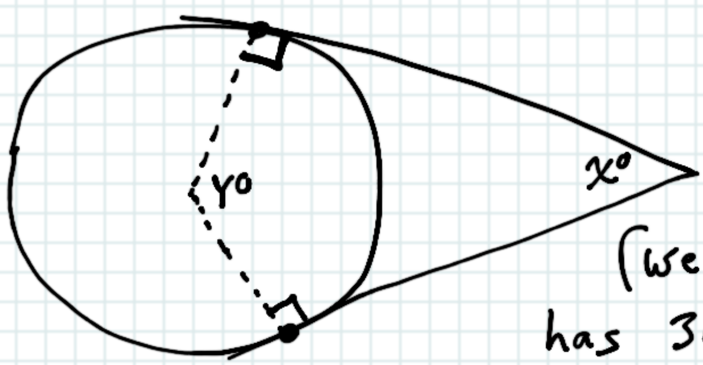
3 theorems that follow from the prior rules:



If two inscribed chord-angles intercept the same arc, then they are congruent.



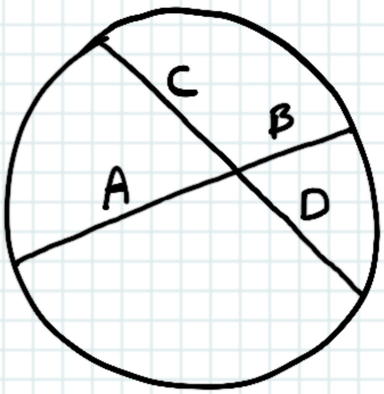
An angle inscribed in a semicircle is a right angle. (angle is ½ the arc measure)



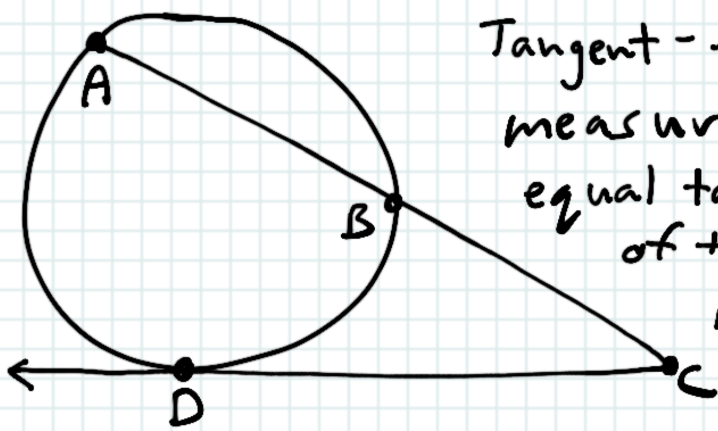
The sum of the measures of a tangent-tangent angle and its minor arc is 180. (we know the quadrilateral has 360°, and 2 angles are right)

$$x + y = 180$$

Power Theorems

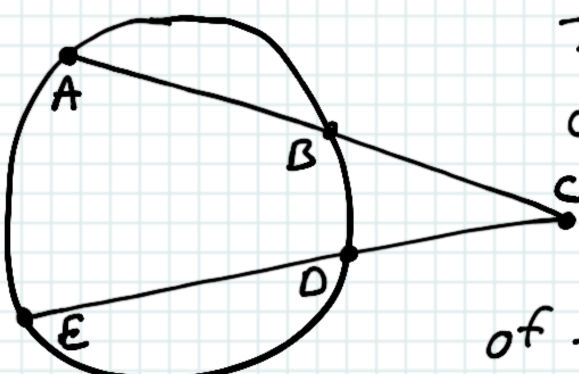


Chord-chord - the product of the measures of the segments of one chord is equal to the product of the measures of the segments of the other chord. $\underline{AB = CD}$



Tangent-Secant - the square of the measure of the tangent segment is equal to the product of the measures of the entire secant segment and its internal part.

$$(CD)^2 = CA \cdot CB$$



The product of the measure of one secant segment and its external part is equal to the product of the measures of the other secant segment and its external part.

$$AC \cdot BC = EC \cdot DC$$