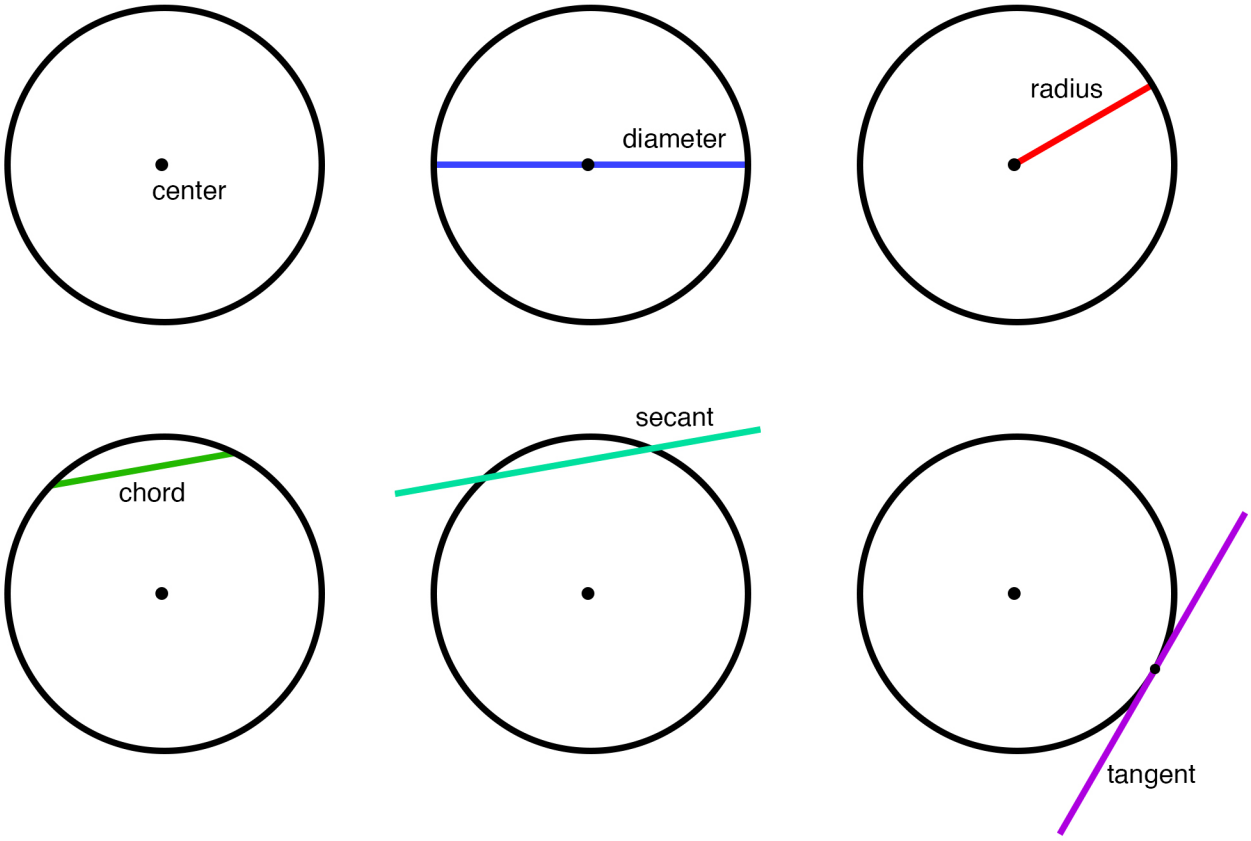
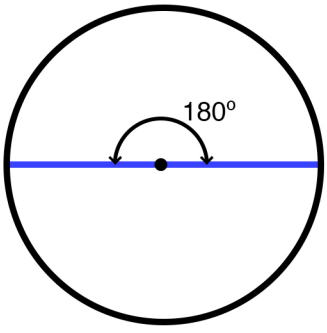
Circles



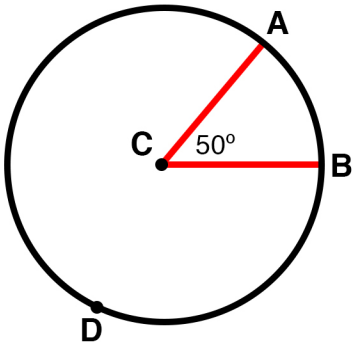
Equation of a circle:

$$(x - h)^2 + (y - k)^2 = r^2$$



The angle measure of the entire circle is 360°.

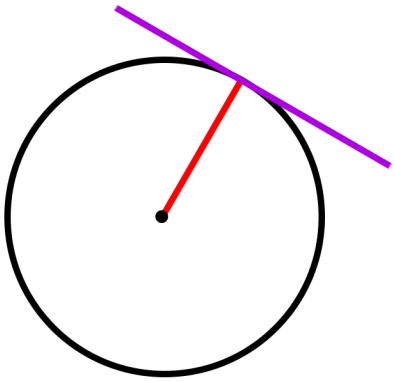
The angle measure of a semicircle is 180°.



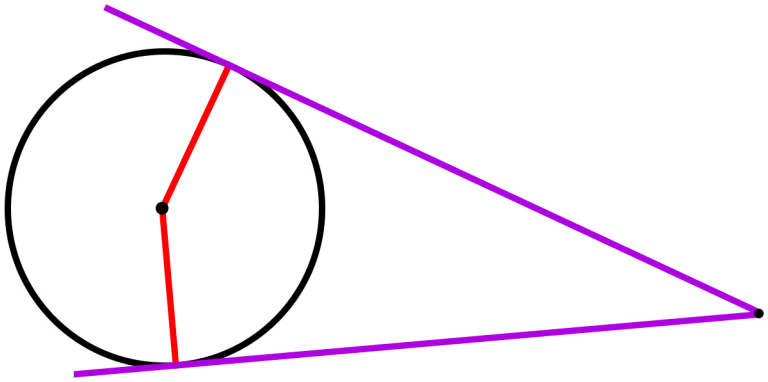
The measure of a minor arc is the measure of the central angle.

The measure of a major arc is equal to 360° - the measure of the minor arc

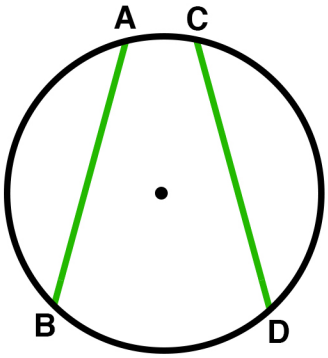
Circle Theorems



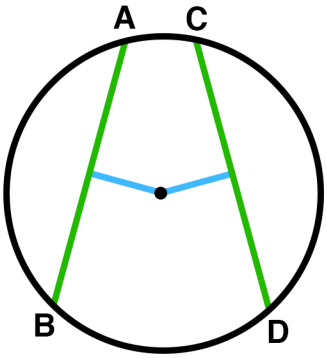
Tangent lines are perpendicular to the radius of the circle at point of tangency.



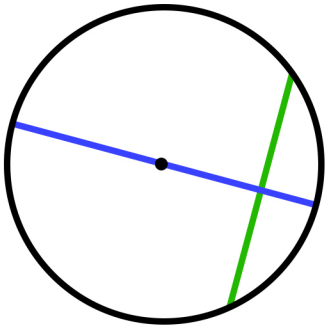
Tangent segments from a common external point are congruent.



In the same circle or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.



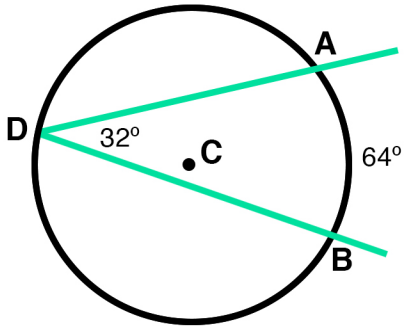
In the same circle or in congruent circles, two chords are congruent if and only if they are equidistant from the center.



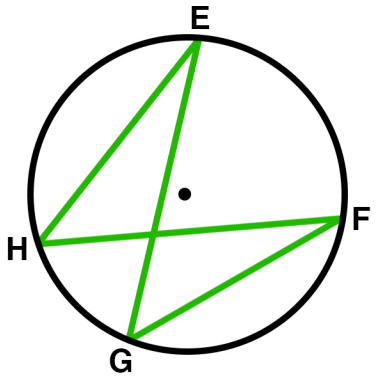
If one chord is a perpendicular bisector of another chord, then the first chord is a diameter.

If a diameter of a circle is perpendicular to a chord, then the diameter bisects the chord and its arc.

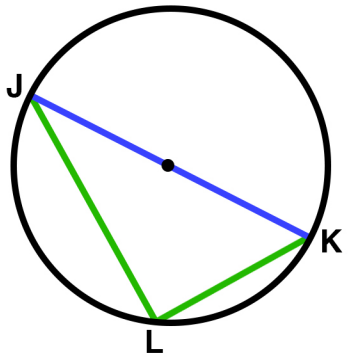
Circle Theorems



The measure of an incribed angle is one half the measure of its intercepted arc.

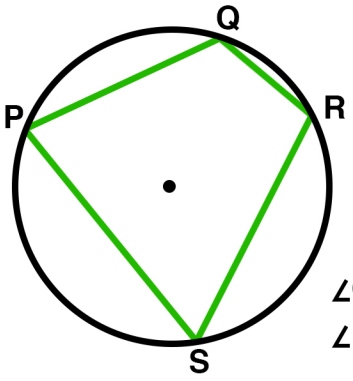


If two inscribed angles of a circle intercept the same arc, then the angles are congruent.



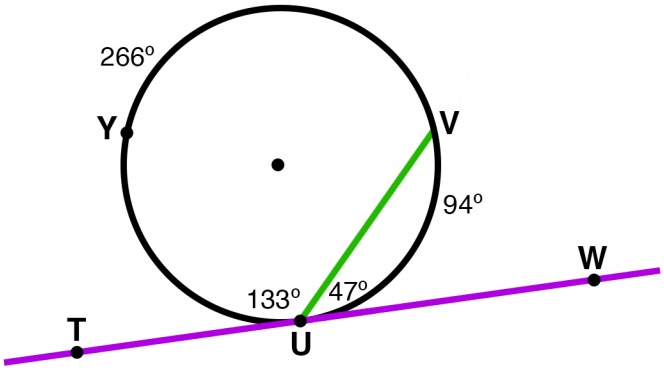
If a right triangle is inscribed in a circle, then the hypotenuse is a diameter of the circle.

Conversely, if one side of an inscribed triangle is a diameter of the circle, then the triangle is a right triangle and the angle opposite the diameter is the right angle.



$\angle Q + \angle S = 180^\circ$
$\angle P + \angle R = 180^\circ$

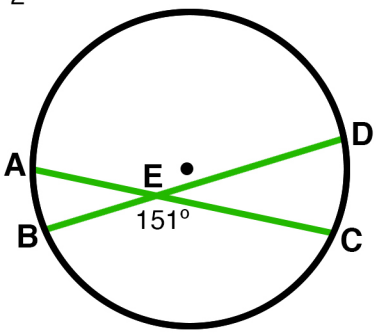
A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.



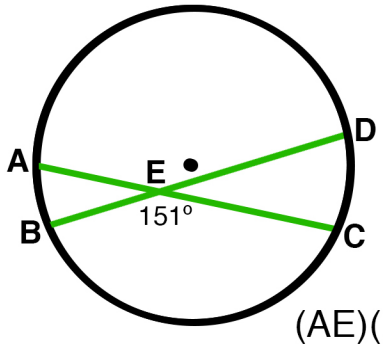
If a tangent and a chord intersect at a point on a circle, then the measure of each angle formed is one half the measure of its intercepted arc.

Circle Theorems

$\angle BEC = \frac{1}{2}(\overset{\frown}{BC} + \overset{\frown}{AD})$

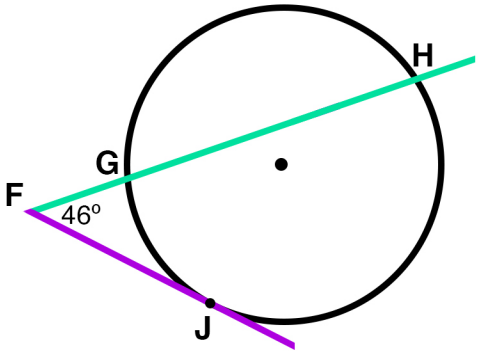


If two chords intersect inside a circle, then the measure of each angle is one half the sum of the measures of the arcs intercepted by the angle and its vertical angle.

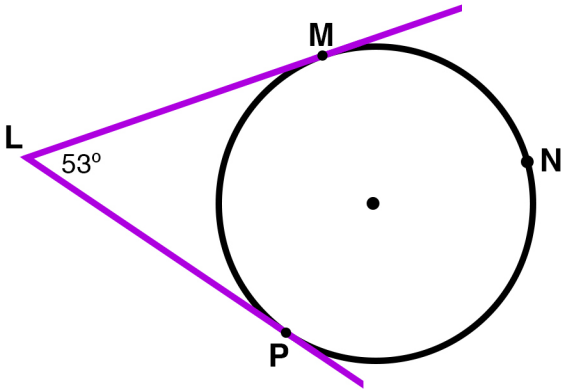


$(AE)(EC) = (BE)(ED)$

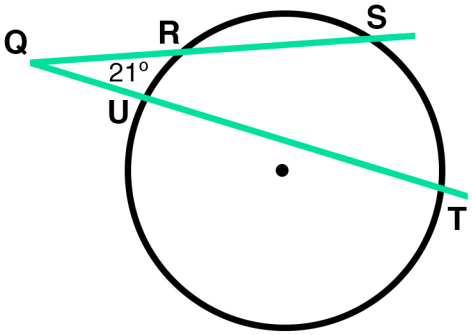
If two chords intersect inside a circle, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord.



$\angle HFJ = \frac{1}{2}(\overset{\frown}{HJ} - \overset{\frown}{GJ})$

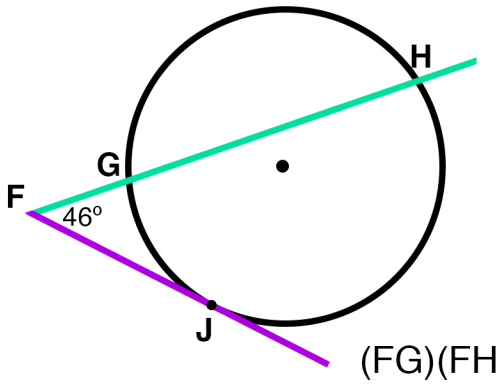


$\angle MLP = \frac{1}{2}(\overset{\frown}{MNP} - \overset{\frown}{MP})$



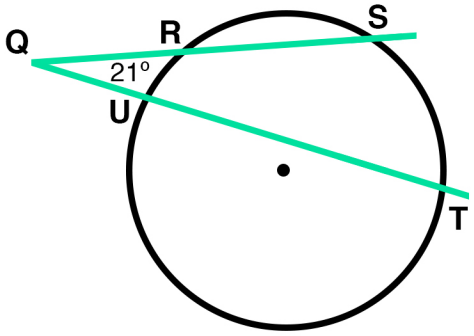
$\angle SQT = \frac{1}{2}(\overset{\frown}{ST} - \overset{\frown}{RU})$

If a tangent and a secant, two tangents, or two secants intersect outside of a circle, then the measure of the angle formed is one half the difference of the measures of the intercepted arcs.



$(FG)(FH) = FJ^2$

If a secant and a tangent segment share an endpoint outside a circle, then the product of the lengths of the secant segment and its external segment equals the square of the length of the tangent segment.



$(QR)(QS) = (QU)(QT)$

If two secant segments share the same endpoint outside a circle, then the product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segment and its external segment.