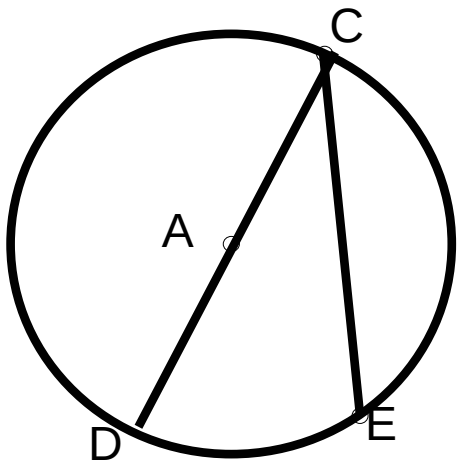
Unit 18 Facts

Topic #1: Angle Measures in a Circle

Theorem #1: If an angle is inscribed in a circle, then the measure of the angle is half the measure of the intercepted arc**.**

Inscribed Angles: vertex on the circle



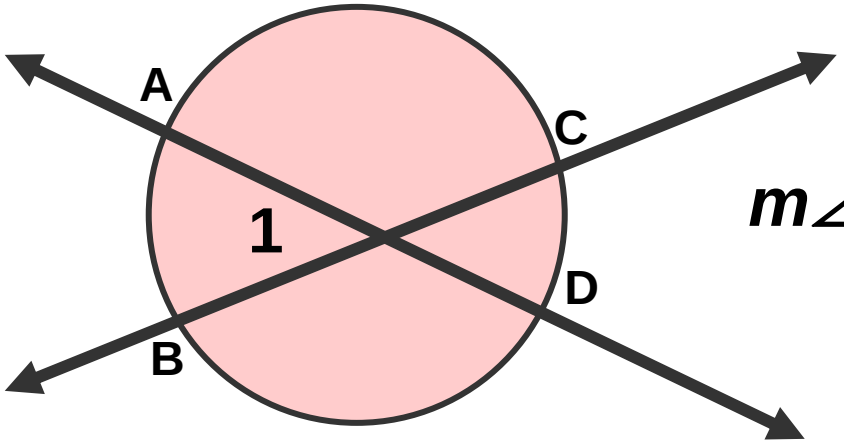
$$m\angle DCE = \frac{1}{2} arcDE$$

Theorem #2: If two inscribed angles of a circle or congruent circles intercept congruent arcs or the same arc, then the angles are congruent.

Theorem #3: If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.

Theorem #4: If two secants intersect in the interior of a circle, then the measure of the angle formed is half the sum of the measures of the arcs intercepted by the angle and its vertical angle.

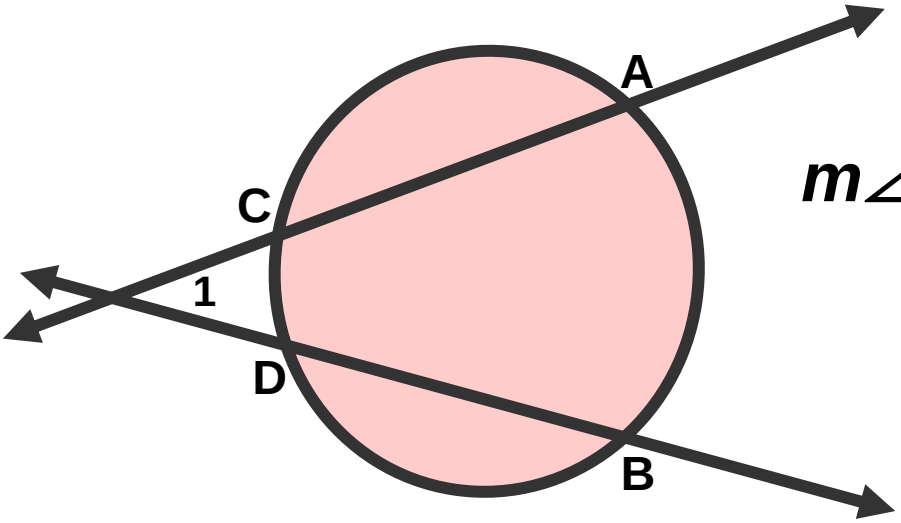
vertex in the circle



$$m\angle 1 = \frac{\overset{\frown}{AB} + \overset{\frown}{CD}}{2}$$

Theorem #5: If two secants, a secant and a tangent, or two tangents intersect in the exterior of a circle, then the measure of the angle formed is half the positive difference of the measures of the intercepted arcs.

Vertex outside the circle



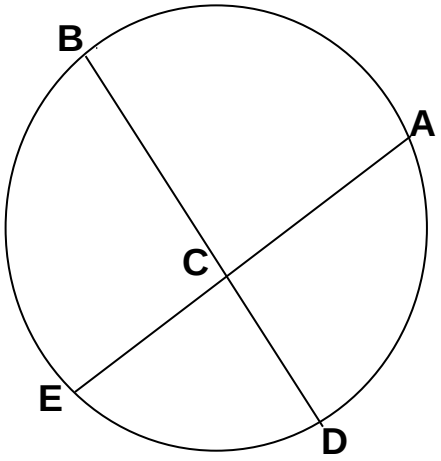
$$m\angle 1 = \frac{\overset{\frown}{AB} - \overset{\frown}{CD}}{2}$$

Topic #2: Special Segments

Segments in a Circle

Theorem #6: If two chords intersect in a circle, then the products of the measures of the segments of the chords are equal.

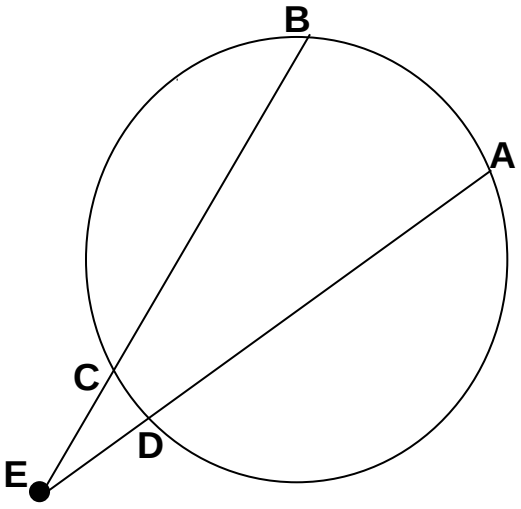
2 CHORDS $\Rightarrow$ Part • Part = Part • Part



$AC \bullet EC = BC \bullet CD$

Theorem #7: If two secant segments are drawn to a circle from an exterior point, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.

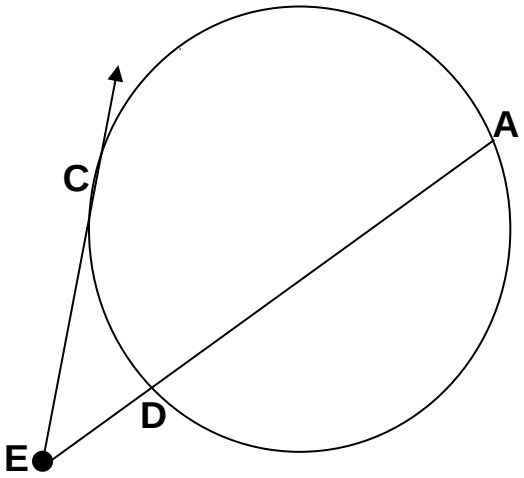
2 SECANTS$\Rightarrow$ Part • Whole = Part •Whole



$EC \bullet EB = ED \bullet EA$

Theorem #8: If a tangent segment and a secant segment are drawn to a circle from an exterior point, then the square of the measure of the tangent segment is equal to the product of the measures of the secant segment and its external secant segment.

SECANT & TANGENT⇒ (Tangent)^2 = Part • Whole



$(EC)^2 = ED \bullet EA$

Topic #3: Circles on the Coordinate Plane

Standard Form for the Equation of a Circle:

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

General Form for the Equation of a Circle:

$Ax^2 + By^2 + Cx + Dy + E = 0$