

Chapter 12 Vocabulary

tangent to a circle - line intersecting a circle in one point

point of tangency - point where a circle and a tangent intersect

inscribed in - a circle inside of a polygon

circumscribed about - a circle outside of a polygon

chord - segment whose endpoints are on a circle

diameter - the longest chord of a circle

radius - one-half a diameter

inscribed angle - an angle whose vertex is on the circle

intercepted arc - the part of the circle intersected by the rays of the angle

secant - a line that contains a chord

equation of a circle in standard form: $(x - h)^2 + (y - k)^2 = r^2$

Chapter 12 Formulas

central angle (x) = intercepted arc

inscribed angle (x) = $\frac{1}{2}$ * (intercepted arc)

exterior angle (x) = $\frac{1}{2}$ * (major arc - minor arc)

secant and a secant: $u * v = t * s$ (think "whole segment times its outside piece = whole segment times its outside piece")

secant and a tangent: $t^2 = u * v$

two intersecting chords produce an angle in line with the arcs:
angle $x = 1/2$ (arc 1 + arc 2)

two intersecting chords produce proportional segments
inside the circle: $r * s = t * u$
(three measures will be given, solve for the missing measure)

Chapter 12 Theorems

If a line is tangent to a circle, then the line is perpendicular to the radius drawn to the point of tangency.

If a line in the plane of a circle is perpendicular to a radius of that circle, then the line is tangent to that circle.

The two segments tangent to a circle from a point outside the circle are congruent.

Congruent arcs have congruent central angles.

Congruent chords have congruent arcs.

Congruent central angles have congruent chords.

Chords equidistant from the center are congruent.

Congruent chords are equidistant from the center.

In a circle, a diameter that is perpendicular to a chord bisects the chord and its arcs.

In a circle, a diameter that bisects a chord (that is NOT a diameter) is perpendicular to the chord.

In a circle, the perpendicular bisector of a chord contains the center of the circle.

Two inscribed angles that intersect the same arc are congruent.

An angle inscribed in a semicircle is a right angle.

The opposite angles of a quadrilateral inscribed in a circle are supplementary.

The equation of a circle at the origin: $x^2 + y^2 = r^2$
"r" is the radius.

The equation of a circle NOT at the origin: $(x - h)^2 + (y - k)^2 = r^2$
"h" and "k" are coordinates for the center of the circle.
"r" is the radius.