Vocabulary

interior of a circle	the set of all points inside the circle
exterior of a circle	the set of all points outside the circle
chord	a segment whose endpoints lie in a circle
secant	a line that intersects a circle at two points
tangent	a line in the same plane as a cicle that intersects it at exactly one point
point of tangency	the point where the tangent and a circle intersect is called the point of tangency
common tangent	a line that is tangent to two circles
central angle	an angle whose vertex is the center of a circle
adjacent arcs	arcs of the same circle that intersect at exactly one point
congruent arcs	two arcs within a circle or two circles that have the same measure
sector of a circle	a region bounded by two radii of the circle and their intercepted arc
segment of a circle	a region bounded by an arc and its chord
arc length	the distance along an arc measured in linear units
inscribed angle	an angle whose vertex is on a circle and whose sides contain chords of the circle
intercepted arc	consists of endpoints that lie on the sides of an inscribed angle and all the points of the circle between them
subtends	a chord or arc subtends an angle if its endpoints lie on the sides of the angle

Formulas

m = arc measurement in degrees

area of a sector of a circle	$A = \pi r^2(m/360)$
area of a segment of a circle	A = area of sector - area of the triangle formed inside the sector
arc length	$L = 2\pi r(m/360)$

Angle Relationships in Circles

vertex of the angle	**measure of angle**
on a circle	half the measure of its intercepted arc
inside a circle	half the sum of the measures of its intercepted arcs
outside a circle	half the difference of the measures of its intercepted arcs

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Pairs of Circles

congruent circles	if and only if they have congruent radii
concentric circles	coplanar circles with the same center
tangent circles	two coplanar circle that intersect at exactly one point

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Arcs

minor arc	an arc whose points are on or in the interior of a central angle	the measure of a minor arc is equal to the measure of its central angle
major arc	an arc whose points are on or in the eterior of a central angle	the measure of a major arc is equal to 360 degrees minus the measure of its central angle
semicircle	when the endpoints of an arc lie on a diameter	the measure of a semicircle is equal to 180 degrees

Theorems & Postulates

12-1-1	if a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency
12-1-2	if a line is perpendicular to a radius of a circle, then the line is tangent to the circle
12-1-3	if two segments are tangent to the same external point, then the segments are congruent
12-2-3	in a circle, if a radius (or diameter) is perpendicular to a chord, then it bisects the chord and its arc
12-2-4	in a circle, the perpendicular bisector of a chord is a radius (or diameter)
12-4-1 inscribed angle theorem	the measure of an inscribed angle is half the measure of its intercepted arc
12-4-2	if inscribed angles of a circle intercept the same arc or are subtended by the same chord or arc then the angles are congruent

Theorems & Postulates (cont)

12-4-3	an inscribed angle subtends a semicircle is and only if the angle is a right angle
12-4-4	if a quadrilateral is inscribed in a circle, then its opposite angles are supplementary
12-5-1	if a tangent and a secant (or chord) intersect on a circle at the point of tangency, then the measure of the angle formed is half the measure of its intercepted arc
12-5-2	if two secants or chords intersect in the interior of a circle, then the measure of each angle formed is half the sum of the measures of its intercepted arcs
12-5-3	if a tangent and a secant, two tangents, or two secants intersect in the exterior of a circle, then the measure of the angle formed is half the difference of the measures of its intercepted arcs

Theorem 12-2-2

in a circle or congruent circles...

1. congruent central angles have congruent chords
2. congruent chords have congruent arcs
3. congruent arcs have congruent central angles

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