Geometry Reference Sheet Chapter 10 2016-2017

Definitions	
Center	The given point from which all points on a circle are equidistant.
Central Angle	An angle whose vertex is the center of the circle.
Chord	A segment whose endpoints are on a circle.
Circle	The set of all points in a plane equidistant from a given point.
Circumscribed Angle	An angle whose sides are tangent to a circle.
Circumscribed Circle	The circle containing the vertices of an inscribed polygon.
Common Tangent	A line or segment that is tangent to two coplanar circles.
Concentric Circles	Coplanar circles that have a common center.
Congruent Arcs	Two arcs with the same measure that are arcs of the same circle or congruent circles.
Congruent Circles	Two circles for which a rigid motion or composition of rigid motions maps one circle onto the other.
Diameter	A chord that contains the center of a circle.
External Segment	The part of a secant segment that is outside the circle.
Inscribed Angle	An angle whose vertex is on the circle and whose sides contain chords of the circle.
Inscribed Polygon	A polygon is inscribed when all its vertices lie on a circle.
Intercepted Arc	An arc that lies between two lines, rays, or segments.
Major Arc (and measure of)	The measure of a major arc is the difference between 360° and the measure of the related minor arc.
Minor Arc (and measure of)	The measure of a minor arc is the measure of its central angle and is less than 180°.
Radius	A segment whose endpoints are the center and any point on a circle.
Secant	A line that intersects a circle in two points.
Secant Segment	A segment that contains a chord of a circle and has exactly one endpoint outside the circle.
Segments of the Chord	When two chords intersect in the interior of a circle, each chord is divided into two segments that are called the segments of the chord.
Semicircle (and measure of)	An arc with endpoints that are endpoints of a diameter. Its measure is 180°.
Similar Arcs	Two arcs with the same measure.
Subtend	If the endpoints of a chord or arc lie on the sides of an inscribed angle, then the chord or arc is said to subtend the angle.
Tangent	A line in the plane of a circle that intersects the circle in exactly one point, the point of tangency.
Tangent Circles	Coplanar circles that intersect in one point.
Tangent Segment	A segment that is tangent to a circle at an endpoint.
Theorems and Corollaries	
Angles Inside the Circle Theorem	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.
Angles Outside the Circle Theorem	If a tangent and a secant, two tangents, or two secants intersect outside a circle, then the measure of the angle formed is one-half the difference of the measures of the intercepted arcs.
Arc Addition Postulate	The measure of an arc formed by two adjacent arcs is the sum of the measures of the two arcs.
Circumscribed Angle Theorem	The measure of a circumscribed angle is equal to 180° minus the measure of the central angle that intercepts the same arc.
Congruent Central Angles Theorem	In the same circle, or in congruent circles, two minor arcs are congruent ***if and only if*** their corresponding central angles are congruent.
Congruent Circles Theorem	Two circles are congruent circles ***if and only if*** they have the same radius.
Congruent Corresponding Chords Theorem	In the same circle, or in congruent circles, two minor arcs are congruent ***if and only if*** their corresponding chords are congruent.
Equidistant Chords Theorem	In the same circle, or in congruent circles, two chords are congruent ***if and only if*** they are equidistant from the center.
Inscribed Angles of a Circle Theorem	If two inscribed angles of a circle intercept the same arc, then the angles are congruent.
Inscribed Quadrilateral Theorem	A quadrilateral can be inscribed in a circle ***if and only if*** its opposite angles are supplementary.

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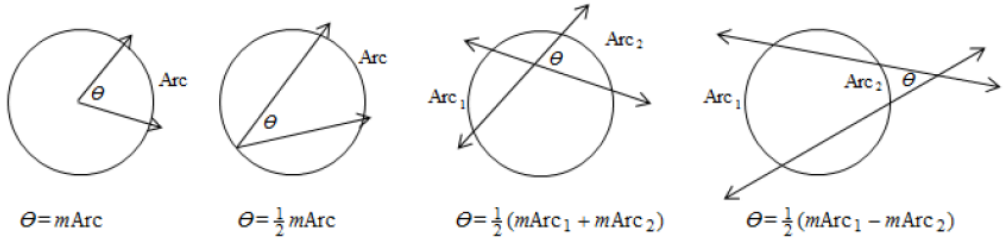
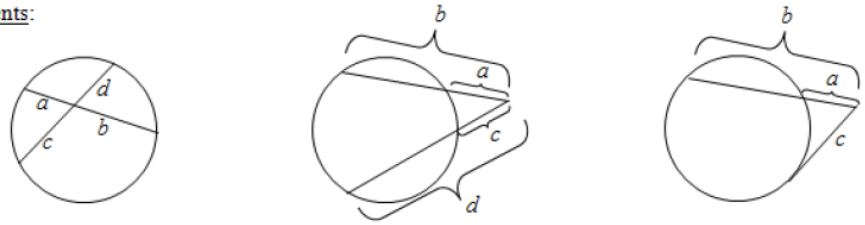
Inscribed Right Triangle Theorem	If a right triangle is inscribed in a circle, then the hypotenuse is a diameter of the circle. Conversely, if one side of an inscribed triangle is a diameter of the circle, then the triangle is a right triangle and the angle opposite the diameter is the right angle.
External Tangent Congruence Theorem	Tangent segments from a common external point are congruent.
Measure of an Inscribed Angle Theorem	The measure of an inscribed angle is one-half the measure of its intercepted arc.
Perpendicular Chord Bisector Theorem	The diameter of a circle is perpendicular to a chord ***if and only if*** the diameter bisects the chord and its arc.
Segments of Chords Theorem	If two chords intersect in the interior of 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.
Segments of Secants Theorem	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.
Segments of Secants and Tangents Theorem	If a secant segment 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.
Similar Circles Theorem	All circles are similar.
Tangent and Intersected Chord Theorem	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.
Tangent Line to Circle Theorem	In a plane, a line is tangent to a circle ***if and only if*** the line is perpendicular to a radius of the circle at its endpoint on the circle.

Angles:



$\theta = m\text{Arc}$ $\theta = \frac{1}{2} m\text{Arc}$ $\theta = \frac{1}{2}(m\text{Arc}_1 + m\text{Arc}_2)$ $\theta = \frac{1}{2}(m\text{Arc}_1 - m\text{Arc}_2)$

Segments:



$a\,b = c\,d$ $a\,b = c\,d$ $a\,b = c^2$