

## Section 7.1 -- Circles

### Definitions:

*Circle:* the set of all points in the same plane that are a fixed distance from a point called its center

*Radius:* a line segment drawn from the center of a circle to one of the points on the circle

*Chord:* a line segment connecting two points on a circle

*Diameter:* a chord that passes through the center of a circle

*Tangent:* a line that has exactly one point of intersection with a circle

*Point of Tangency:* the point of intersection between a circle and a tangent

*Arc:* a continuous portion of a circle

*Semicircle:* an arc of a circle whose endpoints are endpoints of a diameter of a circle

*Major Arc:* an arc that is greater than a semicircle

*Minor Arc:* an arc that is less than a semicircle

*Congruent Circles:* two or more circles with congruent radii

*Central Angle:* an angle whose vertex is at the center of a circle and whose sides are radii of the circle

*Measure of an Arc:* equal to the number of degrees in the central angle that intercepts the arc

*Congruent Arcs:* two arcs in the same circle or congruent circles that have the same measure

*Definition of Betweenness for Arcs:* If  $A$ ,  $B$ , and  $C$  are three points on the same arc, and  $B$  is between  $A$  and  $C$ , then  $m\widehat{AC} = m\widehat{AB} + m\widehat{BC}$  or any equivalent statement.

*Inscribed Angle:* an angle whose vertex is on a circle and whose sides are chords of the circle

*Secant:* a line that intersects a circle in two points

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### Postulates and Theorems:

*From defn. of circle:* All radii of the same circle are congruent.

*Theorem:* The length of a diameter of a circle is twice the length of any of its radii.

*Postulate:* A line drawn from the center of a circle to a point of tangency is perpendicular to the tangent that passes through the point of tangency.

*Postulate:* If a line is perpendicular to a radius at the point where the radius intersects a circle, then the line is tangent to the circle.

*Theorem:* Two circles are congruent if and only if their diameters are congruent.

*Theorem:* The measure of an inscribed angle is equal to  $\frac{1}{2}$  the measure of its intercepted arc.

*Theorem:* The measure of an angle formed by a tangent and a chord is equal to  $\frac{1}{2}$  the measure of its intercepted arc.

*Theorem:* If two chords intersect within a circle, the measure of each angle formed is equal to  $\frac{1}{2}$  the sum of the measures of its intercepted arc and the intercepted arc of its vertical angle.

*Theorem:* The measure of an angle formed by the intersection of two secants outside a circle is equal to  $\frac{1}{2}$  the difference of the measures of the intercepted arcs.

*Theorem:* The measure of an angle formed by the intersection of a tangent and a secant outside a circle is equal to  $\frac{1}{2}$  the difference of the measures of the intercepted arcs.