Due Friday, 3/31:

12.4 p. 508 #35-42

12.5 p. 513 #22-38

12.6 p. 518 #11-15

Ch 12 Review pp. 523-524 #9-16; p. 525 #45-50; p. 526 #55-61

QUIZ - FRIDAY

Chapter 12: Circles

Def: A **circle** is the set of all points in a plane that are at a given distance from a given point in the plane.

Def: Circles are **concentric** iff they lie in the same plane and have the same center.

Def: A **radius** of a circle is a line segment that connects the center of the circle to any point on it.
The radius of a circle is the length of one of these line segments.

Corollary: All radii of a circle are equal.

Def: A **chord** of a circle is a line segment that connects two points of the circle.

Theorem 56: If a line through the center of a circle is perpendicular to a chord, it also bisects the chord.

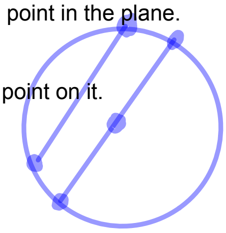
Theorem 57: If a line through the center of a circle bisects a chord that is not a diameter, it is also perpendicular to the chord.

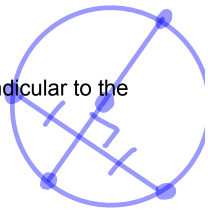
Theorem 58: The perpendicular bisector of a chord of a circle contains the center of the circle.

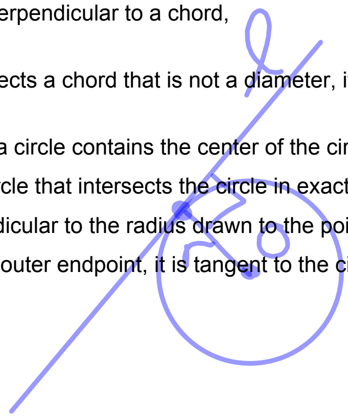
Def: A **tangent** to a circle is a line in the plane of the circle that intersects the circle in exactly one point.

Theorem 59: If a line is tangent to a circle, it is perpendicular to the radius drawn to the point of contact.

Theorem 60: If a line is perpendicular to a radius at its outer endpoint, it is tangent to the circle.



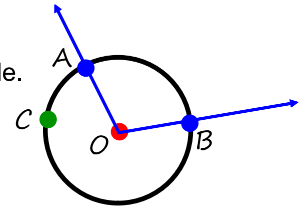




Def: A **central angle** of a circle is an angle whose vertex is the center of the circle.

Def: A **reflex angle** is an angle whose measure is more than 180°

Def: The **degree measure** of an arc is the measure of its central angle.



$\angle AOB$ is a central angle

$\overset{\frown}{AB}$ is the minor arc

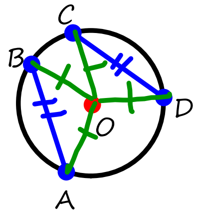
$\overset{\frown}{ACB}$ is the major arc

Postulate 10: The Arc Addition Postulate

If C is on $\overset{\frown}{AB}$, then $m\overset{\frown}{AC} + m\overset{\frown}{CB} = m\overset{\frown}{ACB}$

Theorem 61: In a circle, equal chords have equal arcs.

Theorem 62: In a circle, equal arcs have equal chords.

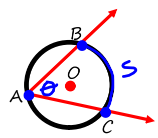


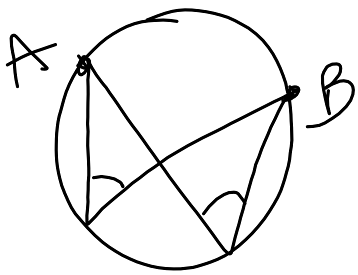
Def: An **inscribed angle** is an angle whose vertex is on a circle, with each of the angle's sides intersecting the circle in another point.

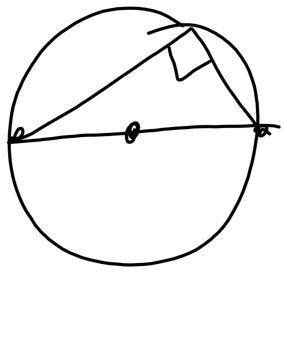
Theorem 63: An inscribed angle is equal in measure to half its intercepted arc.

Corollary 1 to Theorem 63: Inscribed angles that intercept the same arc are equal.

Corollary 2 to Theorem 63: An angle inscribed in a semicircle is a right angle.





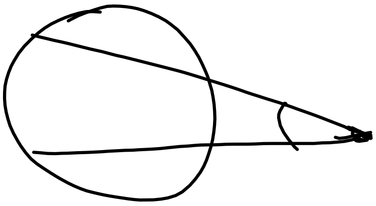


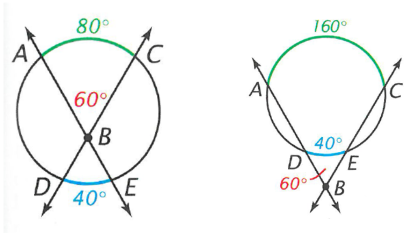
Def: A **secant** is a line that intersects a circle in two points.

Def: A **secant angle** is an angle whose sides are contained in two secants of a circle so that each side intersects the circle in at least one point other than the angle's vertex.

Theorem 64: A secant angle whose vertex is inside a circle is equal in measure to half the sum of the arcs intercepted by it and its vertical angle.

Theorem 65: A secant angle whose vertex is outside a circle is equal in measure to half the difference of its larger and smaller intercepted arcs.





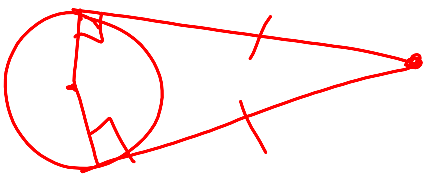
12.6 - Tangent Segments and Intersecting Chords

Def: If a line is tangent to a circle, then any segment of the line having the point of tangency as one of its endpoints is a **tangent segment** to the circle.

Theorem 66: The tangent segments to a circle from an external point are equal.

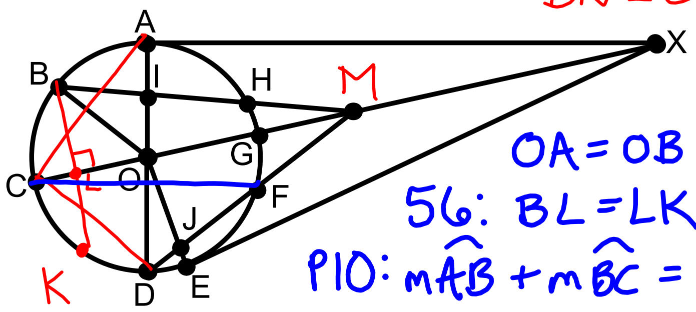
Theorem 67: The Intersecting Chords Theorem

If two chords intersect in a circle, 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.



$ab = xy$

$BK \perp CG$



AX and EX are tangent to circle with center O

AD and CG are diameters

$OA = OB = OC = OD = OE = OG$

56: $BL = LK$ 59: $AX \perp OA; EX \perp OE$

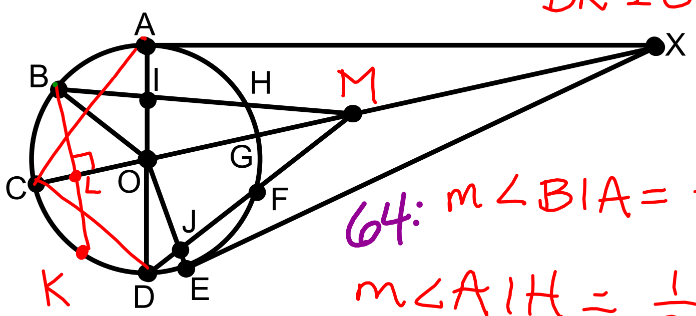
P10: $m\overset{\frown}{AB} + m\overset{\frown}{BC} = m\overset{\frown}{ABC}$

61: $AD = CG \Rightarrow m\overset{\frown}{ACD} = m\overset{\frown}{CAG}$

63: $m\angle ADF = \frac{1}{2} m\overset{\frown}{AHF}$

cor 1: $m\angle ACF = m\angle ADF$ cor2: $\angle ACD = 90^\circ$

$BK \perp CG$



AX and EX are tangent to circle with center O

AD and CG are diameters

64: $m\angle BIA = \frac{1}{2}(m\overset{\frown}{AB} + m\overset{\frown}{DFH})$

$m\angle AIH = \frac{1}{2}(m\overset{\frown}{AH} + m\overset{\frown}{BCD})$

65: $m\angle BMD = \frac{1}{2}(m\overset{\frown}{BCD} - m\overset{\frown}{HGF})$

66: $AX = EX$ 67: $(BI)(IH) = (AI)(ID)$

Ch 13 - The Concurrence Theorems

13.1 - Triangles and Circles

Def: A polygon is **cyclic** iff there exists a circle that contains all of its vertices.

Theorem 68: Every Triangle is cyclic.

Def: A polygon is **inscribed in a circle** iff each vertex of the polygon lies on the circle. The circle is **circumscribed about the polygon**.

Corollary to Theorem 68: The perpendicular bisectors of the sides of a triangle are concurrent.

Construction 9: To circumscribe a circle about a triangle.