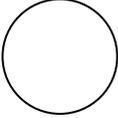
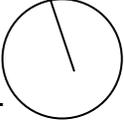
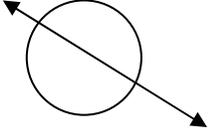
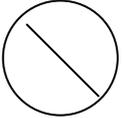
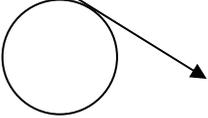
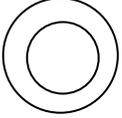
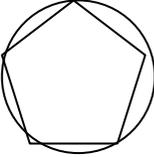
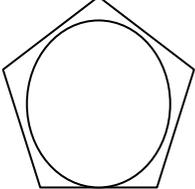


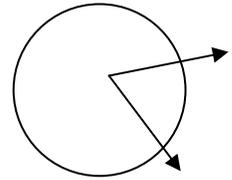
CIRCLES

Terms and Vocabulary:

1. **Circle:** The set of all points in a plane that are equidistant from a fixed point called the **center**. 
2. **Radius:** A segment whose endpoints are the center of a circle and a point *on* the circle. (Note: All **radii** of the same circle are congruent). 
3. **Chord:** A segment whose endpoints are 2 points *on* a circle. 
4. **Secant:** A line that intersects a circle in two points 
5. **Diameter:** A chord that passes through the center of a Circle. 
6. **Tangent:** A line that intersects a circle in exactly one point. 
7. **Concentric Circles:** Circles with the same center are called _____ circles. 
8. **Congruent Circles:** have congruent radii.
9. A polygon is **inscribed** in a circle if its sides are chords of the circle. 
10. 11. A polygon is **circumscribed** about a circle if its sides are tangent to the circle. 
11. A **minor arc** has a measure that is less than 180° . We name a minor with 2 letters.
12. A **major arc** arc has a measure that is greater than 180° . We name a major arc with 3 letters.
13. A **semicircle** is an arc whose endpoints are the endpoints of a diameter. It has a measure of 180° . We name a semicircle with 3 letters.

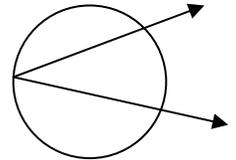
14. **Central Angle:** An angle whose vertex is the center of a circle.

The measure of a **central angle** is **equal to** the measure of its intercepted arc.



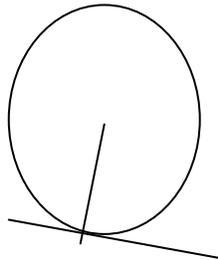
15. **Inscribed Angle:** An angle whose vertex is a point *on* a circle and whose sides contain chords.

The measure of an **inscribed angle** is **half of** the measure of its intercepted arc.



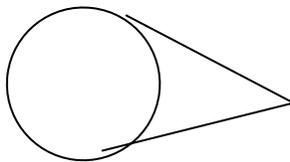
According to theorems:

16.



A radius drawn to a tangent at the point of tangency is **perpendicular** to the tangent.

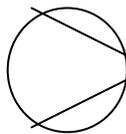
17.



Tangent segments from an exterior point to a circle are congruent.

18. In a circle, or in congruent circles, congruent central angles intercept congruent arcs.

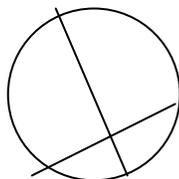
19. In a circle, or in congruent circles, **congruent chords** intercept congruent arcs .



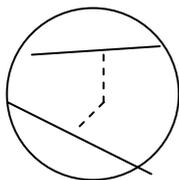
20. If a diameter (or radius) is perpendicular to chord,

then it **bisects** the chord and it **bisects** its arcs.

(Converse is also true).



21



In the same circle (or congruent circles) two Chords are congruent if they are **equidistant** Form the center. (Converse is true)

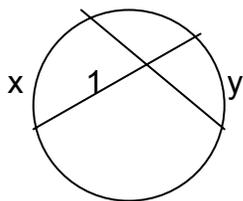
22. If two inscribed angles intercept the same arc, then they are congruent.

23. If an angle is inscribed in a **semicircle** then it is a right angle.

24. If a quadrilateral can be inscribed in a circle then both pairs of its opposite angles are supplementary.

25. The measure of an angle formed by a tangent and a chord/secant intersecting at the point of tangency is equal to **half** measure of the intercepted arc.

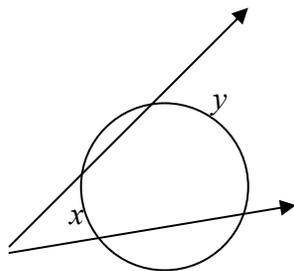
26. If 2 chords intersect in a circle, the measure of each angle is equal to $\frac{1}{2}$ the sum of the intercepted arcs made by the angle and its vertical angle.



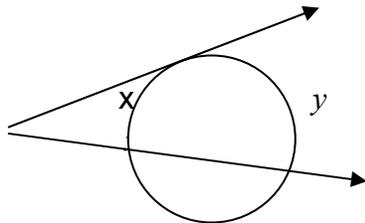
$$m\angle 1 = \frac{1}{2}(x + y)$$

27. If an angle is formed such as one of the above:

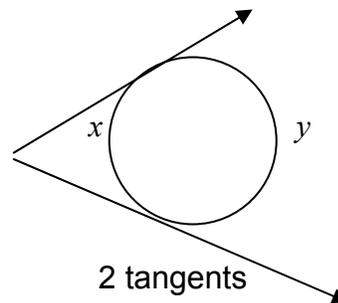
$$m\angle 1 = \frac{1}{2}(y - x)$$



2 secants

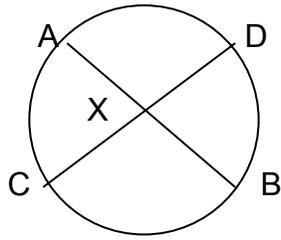


secant and tangent



2 tangents

28

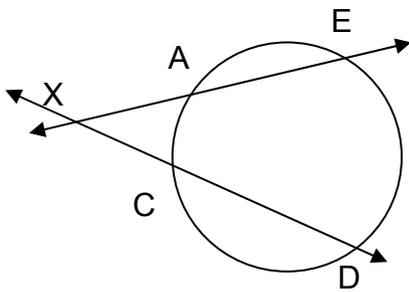


If 2 chords \overline{AB} and \overline{CD} intersect inside a Circle at point X then lengths

(lengths) $AX \cdot XE = CX \cdot XD$

(Hint: It comes from similar triangles)

29.



If 2 secants intersect outside of a circle at X:

(lengths) $AX \cdot XE = CX \cdot XD$

(Hint: It comes from similar triangles).