

# Geometry Ch. 10 Notes      Circles

Name \_\_\_\_\_

## 10.1: Use Properties of Tangents

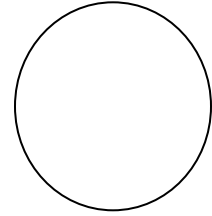
radius:

diameter:

chord:

secant:

tangent:



### Coplanar Circles:

Circles can intersect in

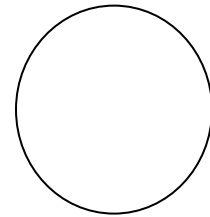
a) two points

b) one point (tangent circles)

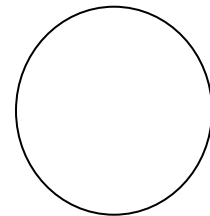
c) no points (concentric circles share the same center)

### Tangent Theorems:

1) Tangent-Radius Theorem:



2) Tangent segments from an external point are congruent



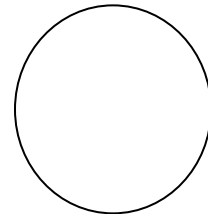
## 10.2: Find Arc Measures (degrees)

central angle:

minor arc:

major arc:

semicircle:



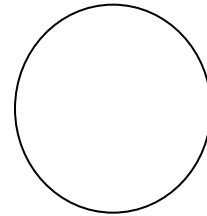
congruent circles:

congruent arcs:

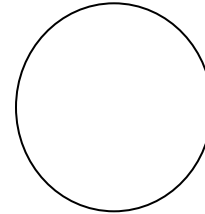
**10.3: Apply Properties of Chords**

**Theorems:**

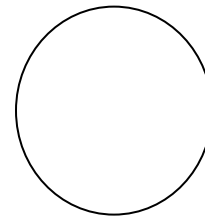
1. In the same circle, two minor arcs are  $\cong$  if their chords are  $\cong$ .



2. **Diameter-Chord Theorem:** If a diameter is perpendicular to a chord, then it bisects the chord and its arc.



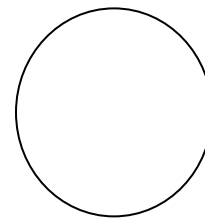
3. In a circle, two chords are  $\cong$  if they are equidistant from the center.  
Drawing:



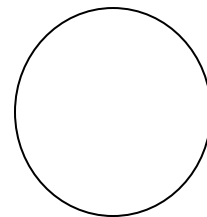
**10.4: Use Inscribed Angles and Polygons**  
intercepted arc:

inscribed angle:

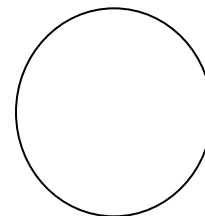
Inscribed Angle Theorem:



inscribed quadrilateral:

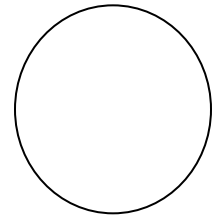


inscribed right triangle:

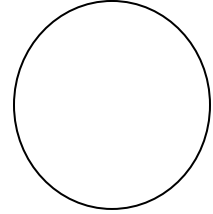


**10.5: Apply Other Angle Relationships in Circles**

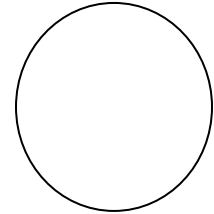
**1. Tangent and chord:** if a tangent and chord intersect at a point on a circle, then the measure of each angle formed is half the measure of its intercepted arc.



**2. Angles inside the circle:** if two chords intersect inside a circle, then the measure of each angle is half the sum of the intercepted arcs.

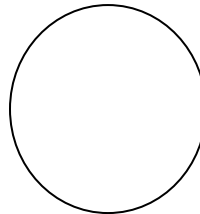
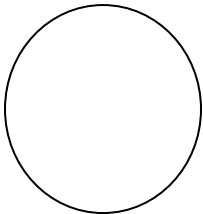


**3. Angles outside the circle:** if a tangent and a secant, two tangents, or two secants intersect outside a circle, then the measure of the angle is half the difference of the intercepted arcs.

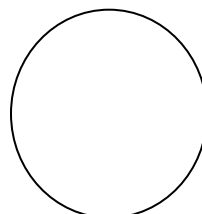
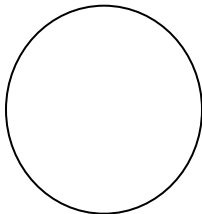


**10.6: Find Segment Lengths in Circles**

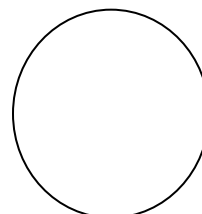
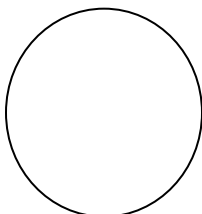
**Segments of Chords Theorem:** formed when two chords intersect inside of a circle. The product of lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord.



**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 other secant segment and its external segment.



**segments of secants and tangents theorem:** if a secant 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.



**10.7: Write and Graph Equations of Circles**

**Standard Equation of a Circle:  $(x-h)^2 + (y-k)^2 = r^2$**

**Center of Circle:  $(h, k)$**

**Writing the equation of a circle:**

**Ex:**

1.

2.

**Graphing a circle:**

**Ex:**

1.

2.

