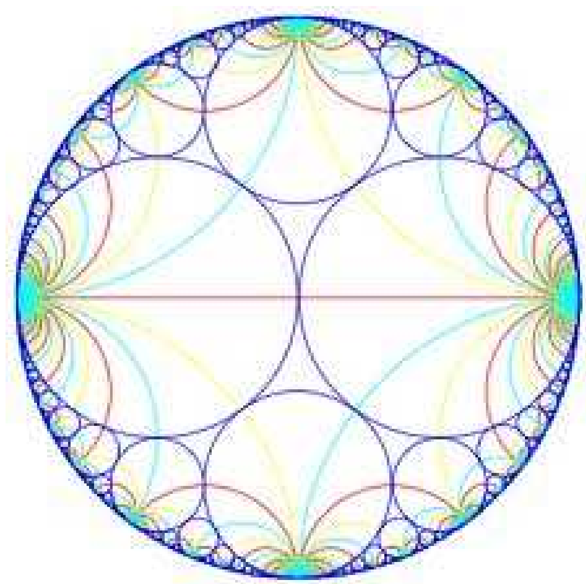
Unit 10 – Geometry
Circles



NAME ________________________________

Period _____________

Geometry

Chapter 10 – Circles

******In order to get full credit for your assignments they must me done on time and you must SHOW ALL WORK. ******

1.____ (**10-1) Circles and Circumference – Day 1-** Pages 526-527 16-20, 32-54 even

2. ____ (10-2) Angles and Arcs – Day 1- Pages 533-535 14 – 31, 32 -42 even, 58

3. ____ (10-2) Angles and Arcs – Day 2- 10-2 Practice WS

4. ____ (10-3) Arcs and Chords– Day 1- Pages 540- 11-20 and 23-35 odd

5. ____ (10-3) Arcs and Chords– Day 2- 10-3 Practice WS

6. ____ (10-4) Inscribed Angles – Day 1- Pages 549-550 8-10, 13-16, 22, 25

7. ____ (10-4) Inscribed Angles – Day 2- 10-4 Practice WS

8. ____ (10-5) Tangents– Day 1 – Pages 556-557 8-18, 23

9. ____ (10-5) Tangents– Day 2 – 10-5 Practice WS

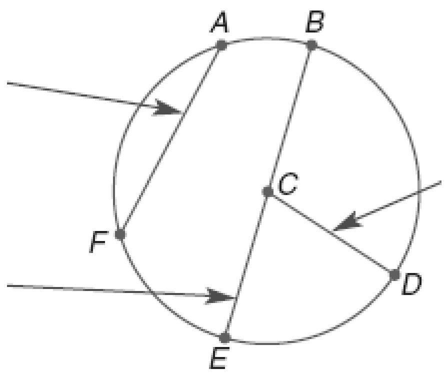
10.____ (10-6) Secants, Tangents, and Angle Measures – Day 1– Pages 564-565 12-32 even

11.____ (10-6) Secants, Tangents, and Angle Measures – Day 2– 10-6 Practice WS

12. _____ Chapter 10 Review

<u>Section 10 – 1: Circles and Circumference</u>
Notes

<u>Circle</u> – a set of _________ equidistant from a given point called the __________ of the circle



- **<u>Chord</u>:** any ________________ with endpoints that are on the __________

  Ex:

- **<u>Diameter</u>:**

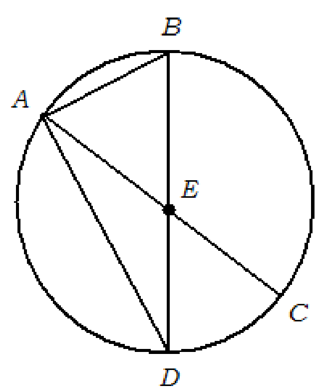
  Ex:

- **<u>Radius</u>:**

  Ex:

C<u>ircumference:</u>

Example #1:



a.) Name the circle.

b.) Name a radius of the circle.

c.) Name a chord of the circle.

d.) Name a diameter of the circle.

e.) If $AC = 18$, find EC.

f.) If $DE = 3$, find AE.

Example #2:

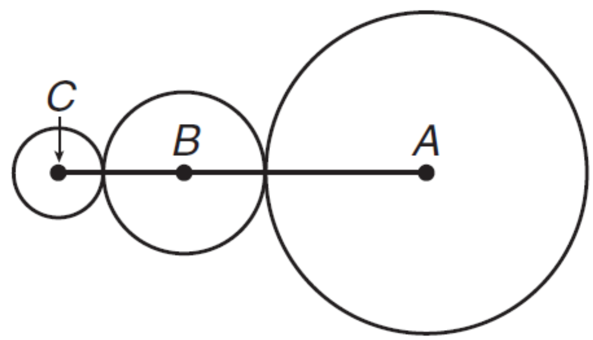
a.) Find C if $r = 13$ inches.

b.) Find C if $d = 6$ millimeters.

b.) Find d and r to the nearest hundredth if $C = 65.4$ feet.

<u>CRITICAL THINKING</u>

In the figure, the radius of circle A is twice the radius of circle B and four times the radius of circle C. If the sum of the circumferences of the three circles is 42π, find the measure of AC.



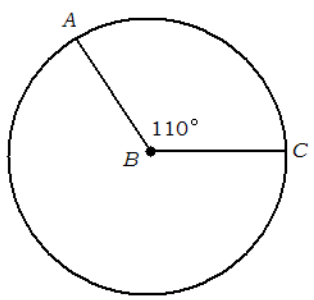
<u>Section 10 – 2: Angles and Arcs</u>
Notes

<u>Angles and Arcs</u>

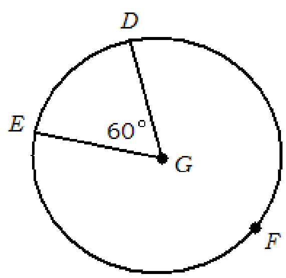
- ✓ A ______________ ___________ has the center of the circle as its ___________, and its sides contain two ___________ of the circle.

<u>Arcs of a Circle</u>

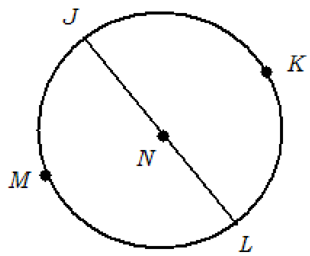
- ✓ **Minor Arc**
  - Arc degree measure equals the measure of the ____________ angle and is __________ than _________.
  - **Ex:**



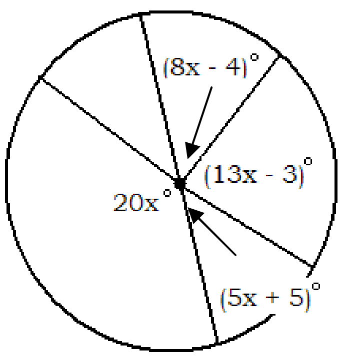
- ✓ **Major Arc**
  - Arc degree measure equals 360 ____________ the measure of the ___________ arc and is _______________ than 180.
  - **Ex:**



- ✓ **Semicircle**
  - Arc degree measure equals ____________________ or ___________.
  - **Ex:**



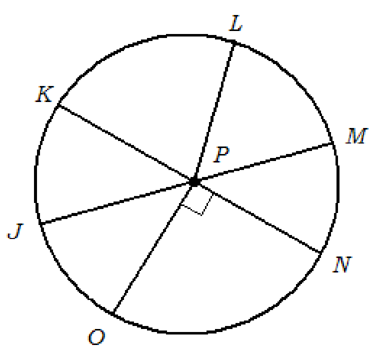
Example #1: Refer to circle *T*.



a.) Find $m\angle RTS$.

b.) Find $m\angle QTR$.

Example #2: In circle *P*, $m\angle NPM = 46$, $\overline{PL}$ bisects $\angle KPM$, and $\overline{OP} \perp \overline{KN}$. Find each measure.



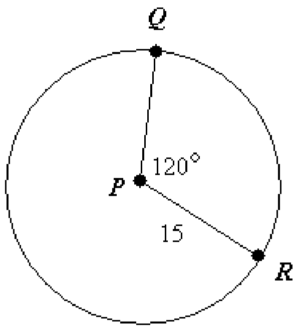
a.) $m\ OK$

b.) $m\ LM$

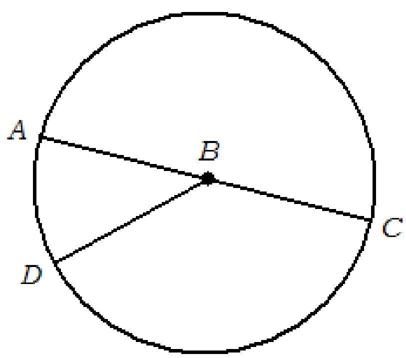
c.) $m\ JKO$

Arc Length

✓ Part of the ______________________.

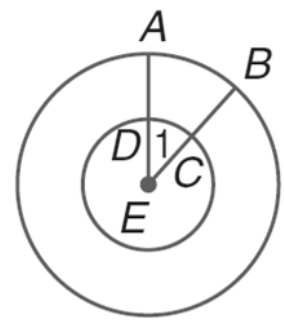


Example #3: In circle B, $AC = 9$ and $m\angle ABD = 40$. Find the length of AD.



<u>CRITICAL THINKING</u>

The circles at the right are concentric circles that both have point E as their center. If m<1 = 42. Determine whether arc AB is congruent to arc CD. Explain.



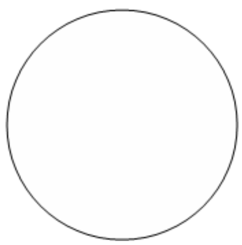
Section 10 – 3: Arcs and Chords
Notes

Arcs and Chords

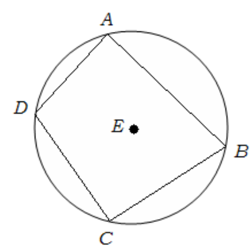
- ✓ The _________________ of a chord are also endpoints of an _______.

Theorem 10.2: In a circle, two ___________ arcs are congruent if and only if their corresponding _____________ are congruent.

Ex:



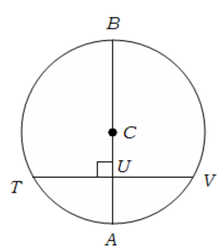
Inscribed and Circumscribed



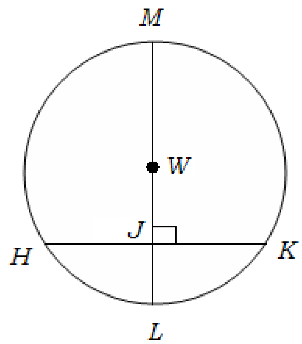
- ✓ The chords of ________________ arcs can form a ________________.
- ✓ Quadrilateral *ABCD* is an _______________ polygon because all of its ______________ lie on the circle.
- ✓ Circle E is ____________________ about the polygon because it contains all of the vertices of the ________________.

Theorem 10.3: In a circle, if the diameter (or radius) is _________________ to a chord, then it ___________ the chord and its arc.

Ex:



Example #1: Circle *W* has a radius of 10 centimeters. Radius $\overline{WL}$ is perpendicular to chord $\overline{HK}$, which is 16 centimeters long.

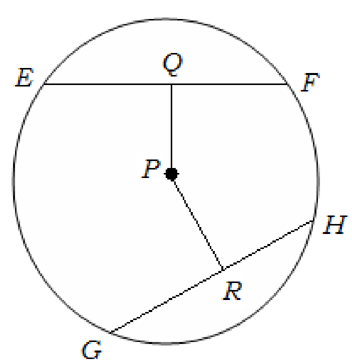


a.) If *mHL* = 53, find *mMK*.

b.) Find *JL*.

<u>Theorem 10.4</u>: In a circle, two ___________ are congruent if and only if they are ___________________ from the center.

Example #2: Chords $\overline{EF}$ and $\overline{GH}$ are equidistant from the center. If the radius of circle *P* is 15 and $EF = 24$, find *PR* and



CRITICAL THINKING

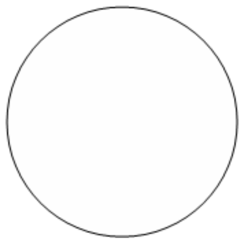
A diameter of circle P has endpoints A and B. Radius PQ is perpendicular to AB. Chord DE bisects PQ and is parallel to AB. Does DE = ½ (AB)? Explain. (Hint: Draw a picture!)

<u>Section 10 – 4: Inscribed Angles</u>
Notes

<u>Inscribed Angles</u>

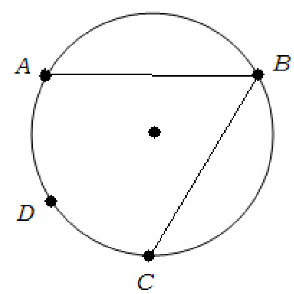
✓ An inscribed angle is an angle that has its ______________ on the circle and its ____________ contained in _____________ of the circle.

Ex:

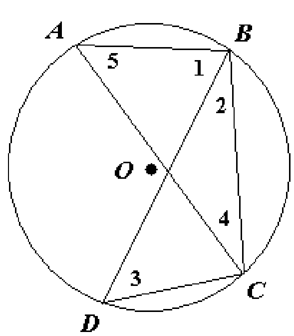


<u>Theorem 10.5</u>: If an angle is _______________ in a circle, then the measure of the angle equals _______________ the measure of its intercepted arc (or the measure of the ____________________ arc is ____________ the measure of the inscribed angle).

Ex:

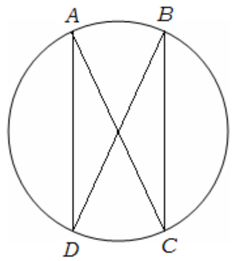


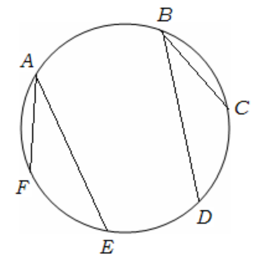
Example #1: In circle O, $mAB = 140$, $mBC = 100$, and $mAD = mDC$. Find the measures of the numbered angles.



<u>Theorem 10.6</u>: If two inscribed angles of a ____________ (or congruent circles) intercept ___________________ arcs or the same arc, then the angles are _________________.

Ex:

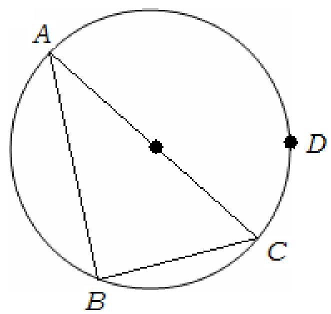




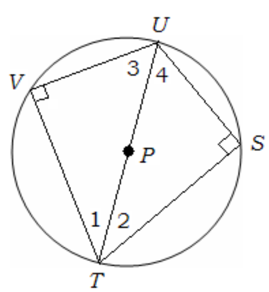
<u>Angles of Inscribed Polygons</u>

<u>Theorem 10.7</u>: If an inscribed angle intercepts a semicircle, the angle is a _____________ angle.

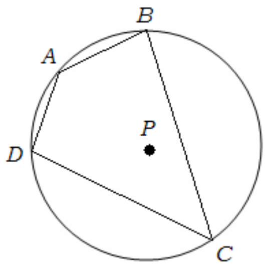
Ex:



Example #2: Triangles *TVU* and *TSU* are inscribed in circle *P*, with $VU \cong SU$. Find the measure of each numbered angle if $m\angle 2 = x + 9$ and $m\angle 4 = 2x + 6$.

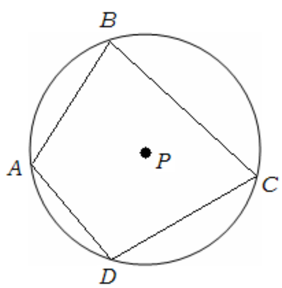


Example #3: Quadrilateral *ABCD* is inscribed in circle *P*. If $m\angle B = 80$ and $m\angle C = 40$, find $m\angle A$ and $m\angle D$.



<u>Theorem 10.8</u>: If a quadrilateral is ________________ in a circle, then its _________________ angles are _______________________.

Ex:



CRITICAL THINKING

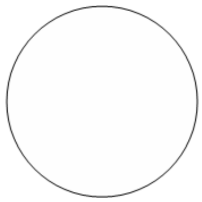
A trapezoid ABCD is inscribed in circle O. Explain how you can verify that ABCD must be an isosceles trapezoid.

Section 10 – 5: Tangents
Notes

Tangents

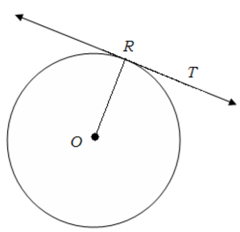
- ✓ **Tangent** – a line in the plane of a ___________ that intersects the circle in exactly one _____________.
- ✓ The point of intersection is called the _________ ___ _____________.

Ex:

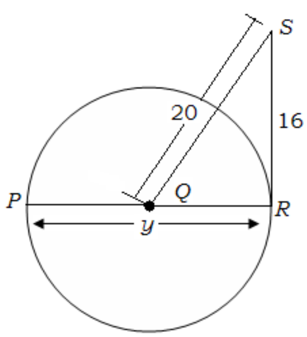


Theorem 10.9: If a line is _______________ to a circle, then it is ________________________ to the _____________ drawn to the point of _____________.

Ex:

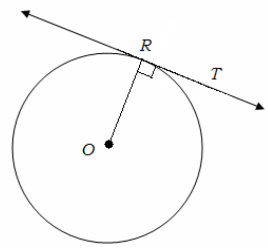


Example #1: $\overline{RS}$ is tangent to circle Q at point R. Find y.



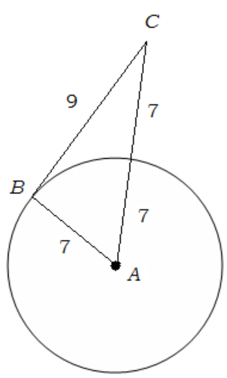
<u>Theorem 10.10</u>: If a __________ is perpendicular to a radius of a circle at its _______________ on the circle, then the line is ______________ to the circle.

Ex:

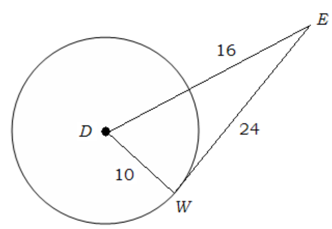


Example #2: Determine whether the given segments are tangent to the given circles.

a.) $\overline{BC}$

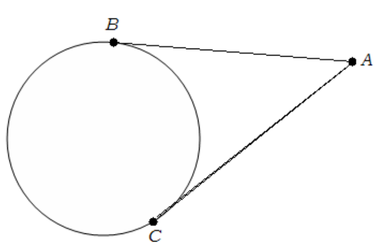


b.) $\overline{WE}$

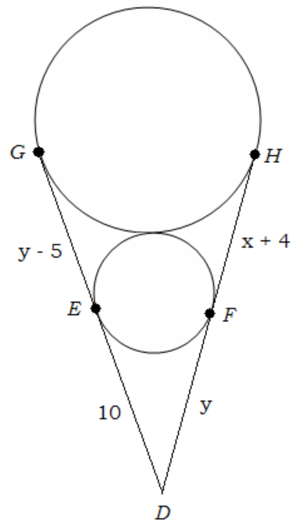


<u>Theorem 10.11</u>: If two _______________ from the same exterior point are ______________ to a circle, then they are _________________.

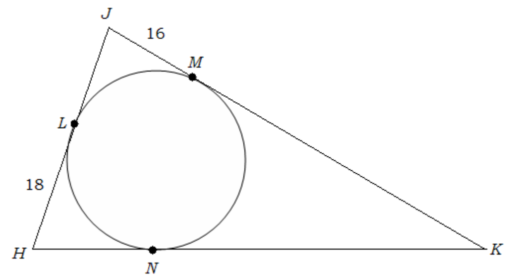
Ex:



Example #3: Find x. Assume that segments that appear tangent to circles are tangent.

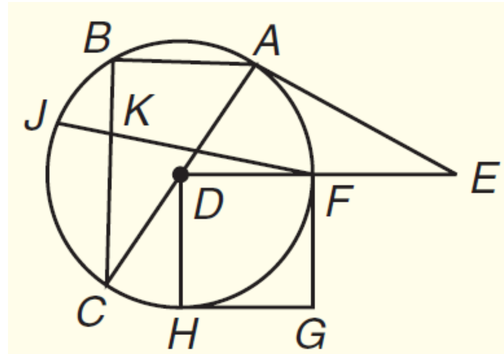


Example #4: Triangle *HJK* is circumscribed about circle *G*. Find the perimeter of ΔHJK if $NK = JL + 29$.



<u>CRITICAL THINKING</u>

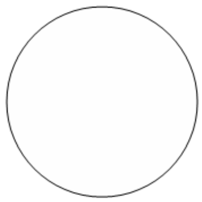
AE is a tangent. If AD = 12 and FE = 18, how long is AE to the nearest tenth unit?



Section 10 – 6: Secants, Tangents, and Angle Measures
Notes

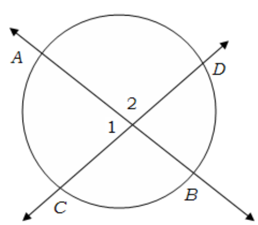
Secant – a line that intersects a circle in exactly _________ points

Ex:



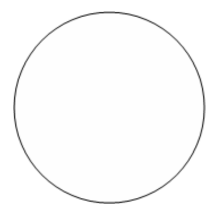
Theorem 10.12: (Secant-Secant Angle)

Ex:

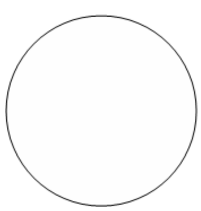
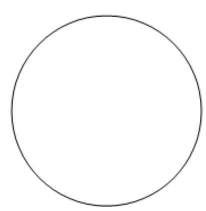
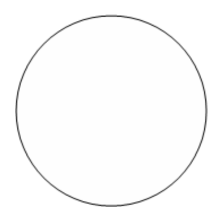


Theorem 10.13: (Secant-Tangent Angle)

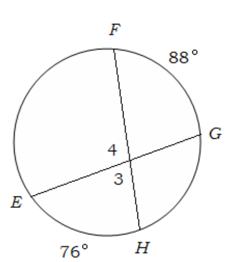
Ex:



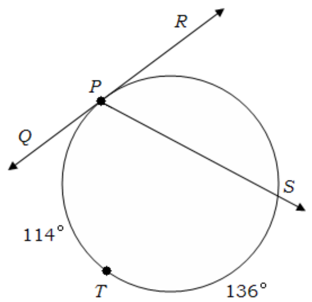
Theorem 10.14:

Two Secants	Secant-Tangent	Two Tangents
		

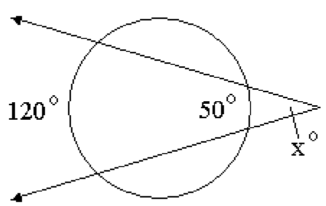
Example #1: Find $m\angle 3$ and $m\angle 4$ if *mFG* = 88 and *mEH* = 76.



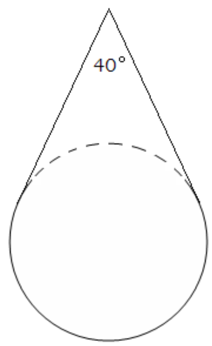
Example #2: Find $m\angle RPS$ if $mPT = 144$ and $mTS = 136$.



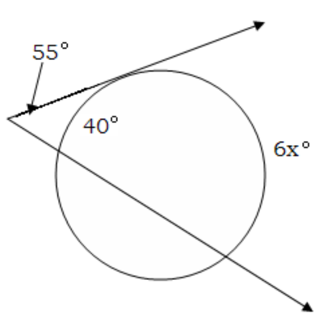
Example #3: Find *x*.



Example #4: Use the figure to find the measure of the bottom arc.



Example #5: Find *x*.



CRITICAL THINKING

In the figure, <3 is a central angle. List the numbered angles in order from greatest measure to least measure. Explain your reasoning.