

NAME _____

Date _____

Period _____

SYLLABUS

GEOMETRY H

Unit 9 Syllabus: Circles

<u>Day</u>	<u>Topic</u>
1	Tangent Lines
2	Chords and Arcs and Inscribed Angles
3	Review/Graded Classwork
4	Review from before Break
5	Finding Angle Measures
6	Finding Segment Lengths
7	Review
8	Test

NAME _____

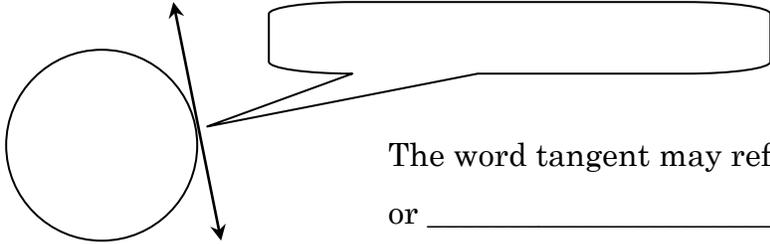
Date _____ Period _____

NOTES

GEOMETRY H

Tangent Lines - Unit 9 Day 1

1. A tangent line is a line that intersects a circle in exactly _____.



The word tangent may refer to a _____, _____, or _____.

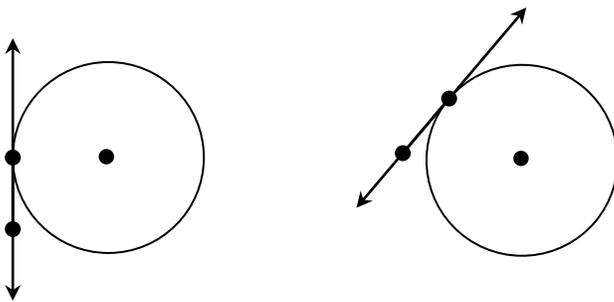
2. A line that intersects a circle in two points is called a _____ line.

a. More on this to come...

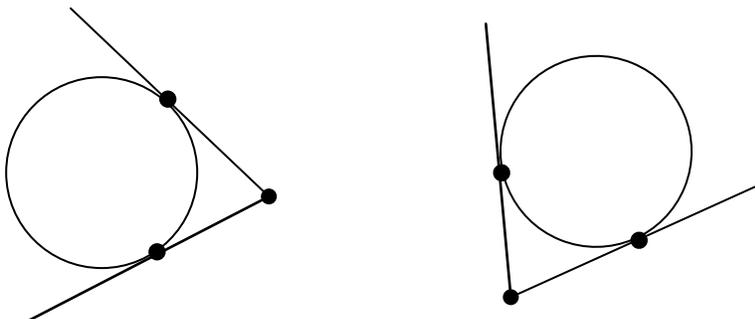
3. Today's goal: Demonstrate an understanding of two important properties of tangents.

If a line is drawn tangent to a circle, and a radius is drawn to the point of tangency...
then the tangent line and radius are _____.

* The converse is also true!

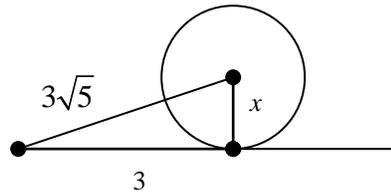
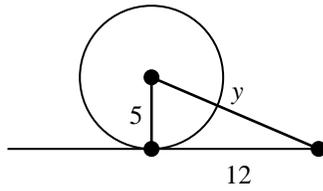


If two lines are tangent to the same circle...then the segments from their intersection to the point of tangency are _____.

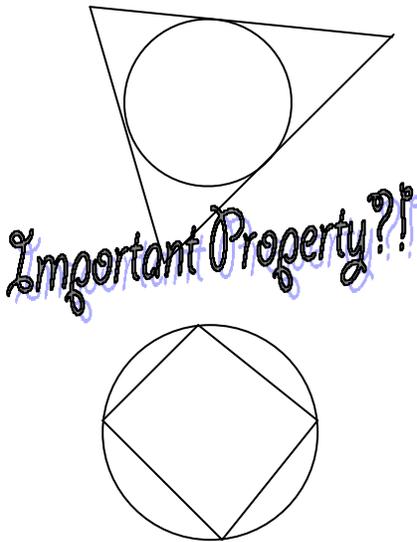


4. Wonderful applications of the two important properties...

a. Tangent segments and radii create _____



b. Circumscribed polygons...



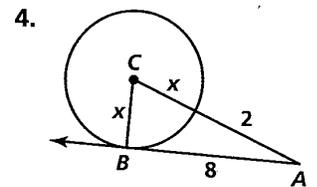
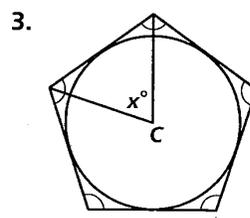
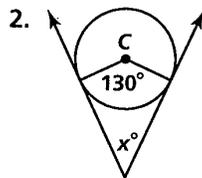
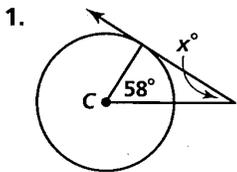
Triangle is _____ about the circle

Circle is _____ in the triangle

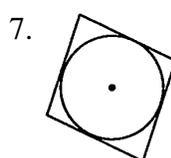
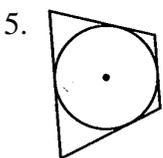
Quadrilateral is _____ in the circle

Circle is _____ about the quadrilateral

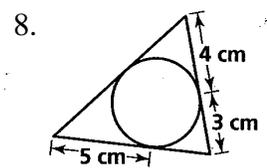
Assume that lines that appear to be tangent are tangent. C is the center of each circle. Find the value of x .



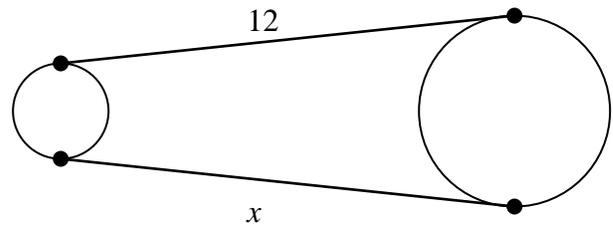
Tell whether each polygon is inscribed in or circumscribed about the circle.



Find the Perimeter!

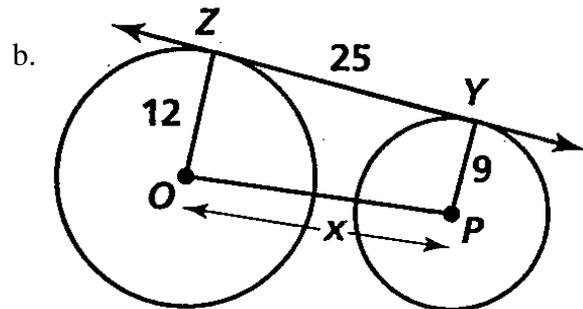
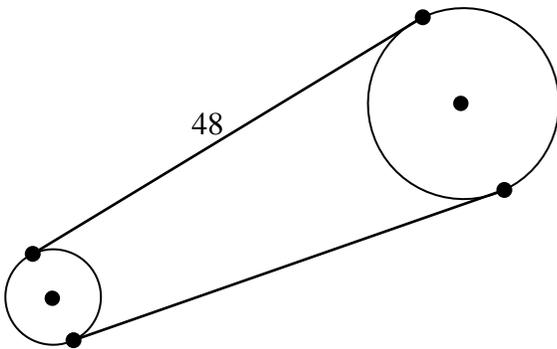


5. A pulley system (proof p. 664)...



Smaller radius = 10 Larger radius = 24 What is the distance from center to center?

a.



Closure: Describe the two properties of tangents that we learned today!

NAME _____

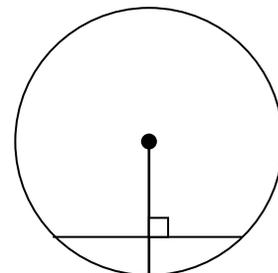
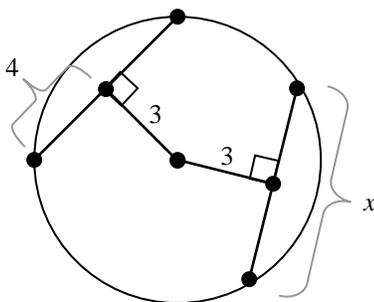
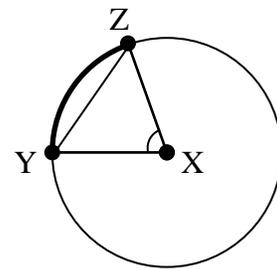
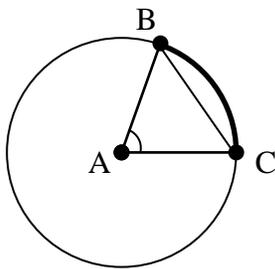
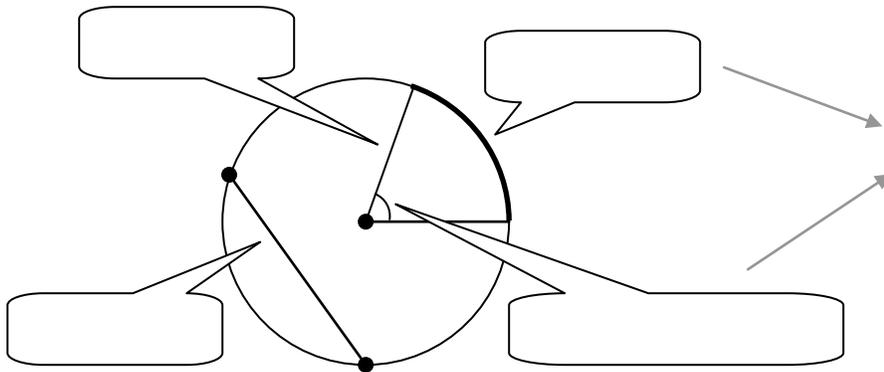
Date _____ Period _____

NOTES

GEOMETRY H

Chords, Arcs, and Inscribed Angles - Unit 9 Day 2

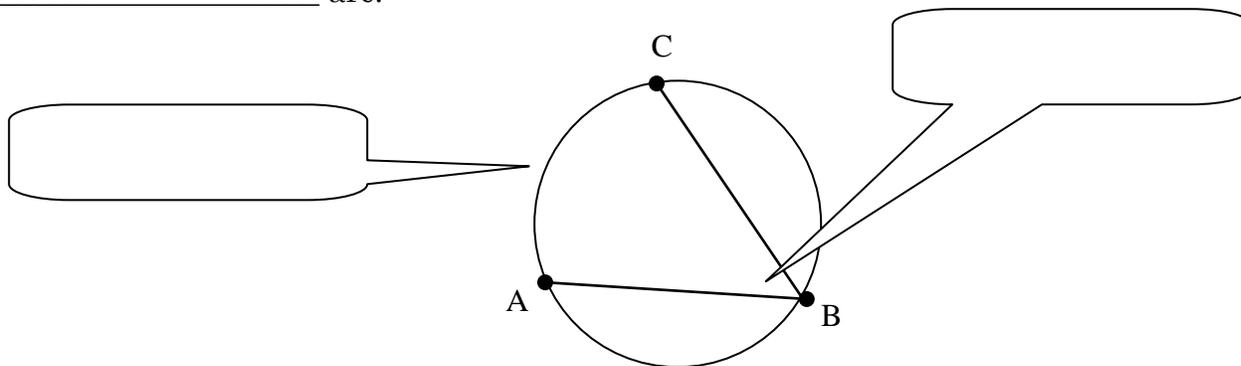
Important properties that hold within one circle, or in two (or more) congruent circles...



In Summary...

- a) Congruent central angles have congruent chords
- b) Congruent chords have congruent arcs
- c) Congruent arcs have congruent central angles
- d) Chords equidistant from the center are congruent/bisected by the radius

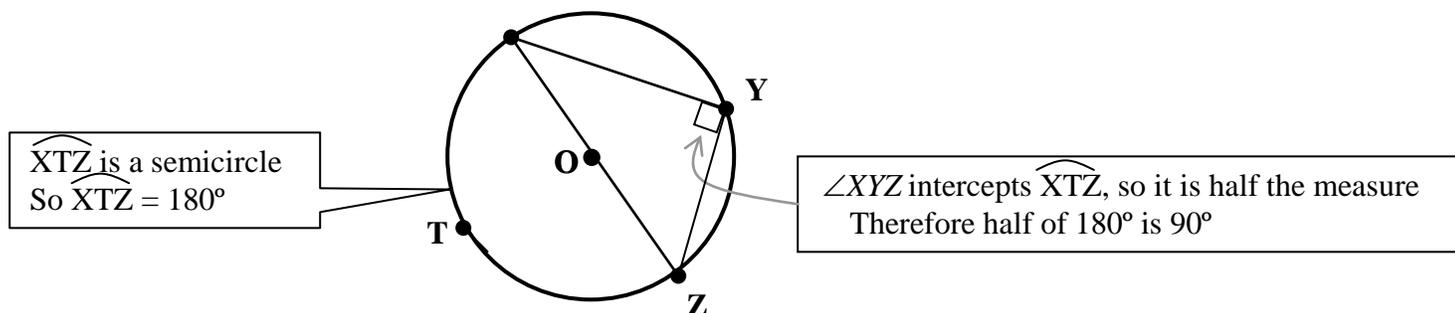
Two chords create an _____ angle. The arc that is formed is called an _____ arc.



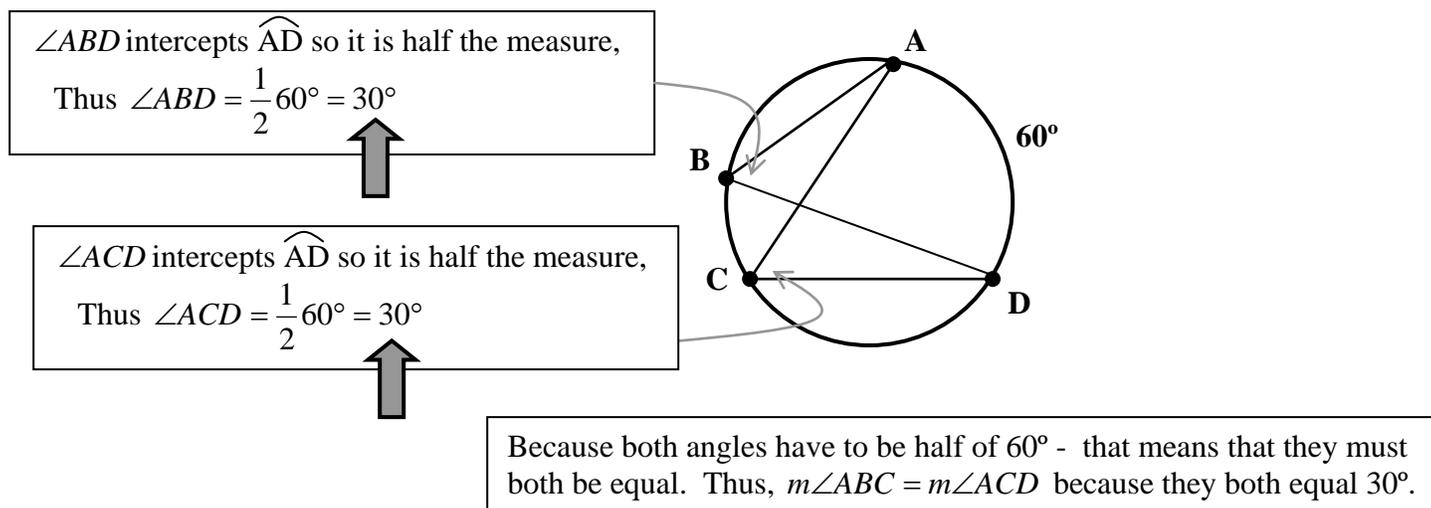
1. **The Inscribed Angle Theorem:** The measure of the inscribed angle is _____ the measure of its intercepted arc



a) Right-Angle Corollary: If an inscribed angle intercepts a semicircle, then the angle is right

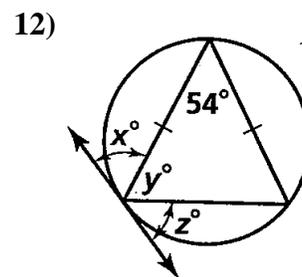
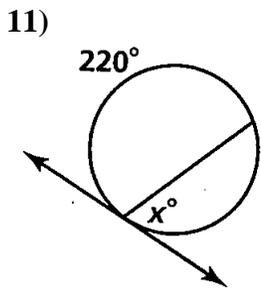
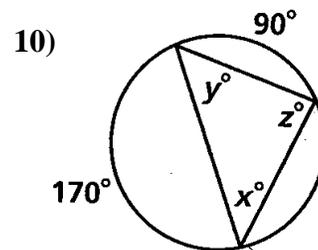
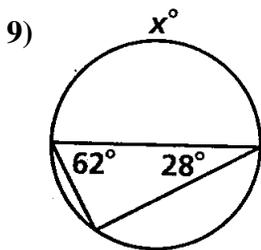
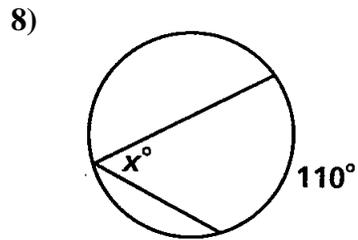
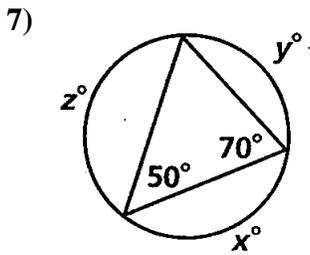
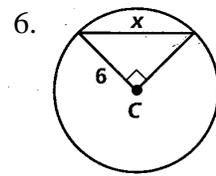
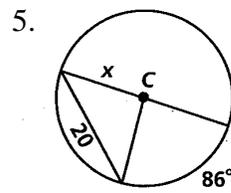
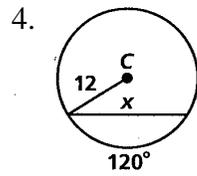
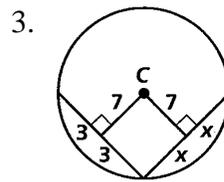
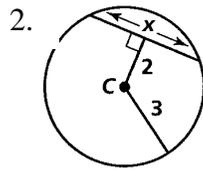
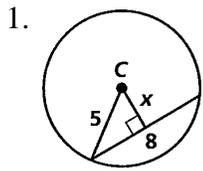


b) Arc-Intercept Corollary: If two inscribed angles intercept the same arc, then they have the same measure.

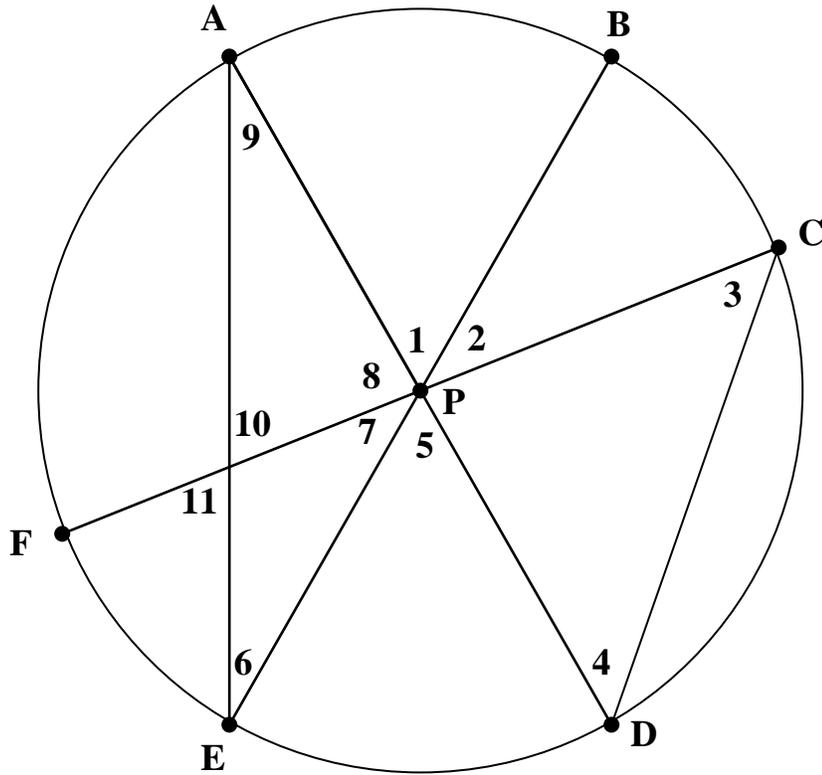


c) The opposite angles of a quadrilateral inscribed in a circle are _____.

Find the value of x to the nearest tenth.



In circle P shown below, $m\angle 1 = 50^\circ$ and $m\widehat{FA} = 75^\circ$. Find each angle and arc below.



$m\angle 2 = \underline{\hspace{2cm}}$

$m\angle 9 = \underline{\hspace{2cm}}$

$m\angle 3 = \underline{\hspace{2cm}}$

$m\angle 10 = \underline{\hspace{2cm}}$

$m\angle 4 = \underline{\hspace{2cm}}$

$m\angle 11 = \underline{\hspace{2cm}}$

$m\angle 5 = \underline{\hspace{2cm}}$

$m\widehat{AB} = \underline{\hspace{2cm}}$

$m\angle 6 = \underline{\hspace{2cm}}$

$m\widehat{BC} = \underline{\hspace{2cm}}$

$m\angle 7 = \underline{\hspace{2cm}}$

$m\widehat{CD} = \underline{\hspace{2cm}}$

$m\angle 8 = \underline{\hspace{2cm}}$

$m\widehat{DE} = \underline{\hspace{2cm}}$

$m\widehat{EF} = \underline{\hspace{2cm}}$

NAME _____

CLASSWORK

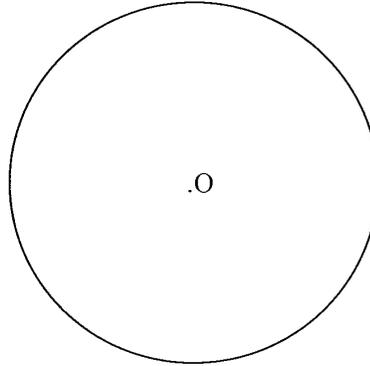
Date _____ Period _____

GEOMETRY H

Unit 9 Day 4: Post Holiday Break Review!

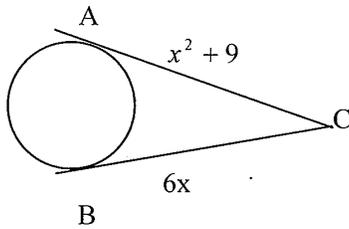
1. Label each line or segment on circle O.

- a. radius \overline{OP}
- b. diameter \overline{NR}
- c. tangent \overline{RL}
- d. chord \overline{NP}
- e. secant \overline{XY}
- f. $\angle NOP$ is called a _____ angle, since it's vertex is at point O.



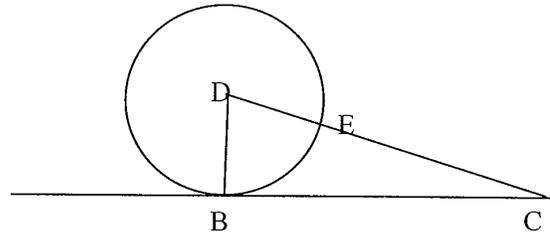
Solve for the indicated sides. Points A and B are points of tangency for the given circles.

2.



AC = _____

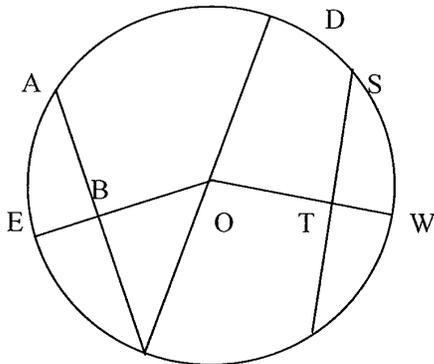
3. Given Circle D; DB = 5; BC = 12



EC = _____

4. Find all indicated segment lengths and arc measures for circle O. (Picture is not drawn to scale.)

$\overline{OB} \perp \overline{AC}$; $\overline{OT} \perp \overline{RS}$; $m\angle EOC = 60$; $OD = 10$; $\overline{AC} \cong \overline{RS}$

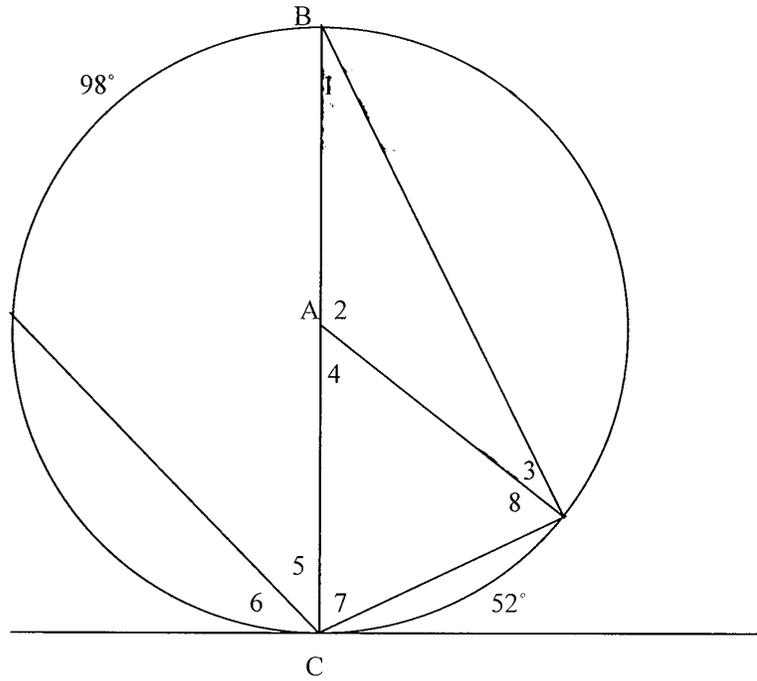


- a. OC = _____
- b. OB = _____
- c. BE = _____
- d. BC = _____
- e. AB = _____
- f. OT = _____
- g. SR = _____
- h. $m\widehat{EC}$ = _____
- i. $m\widehat{AC}$ = _____
- j. $m\widehat{SR}$ = _____

C R

5. Find the measures of all of the angles below for Circle A.

\overline{BC} is a diameter and point C is a point of tangency. (Picture is not drawn to scale.)

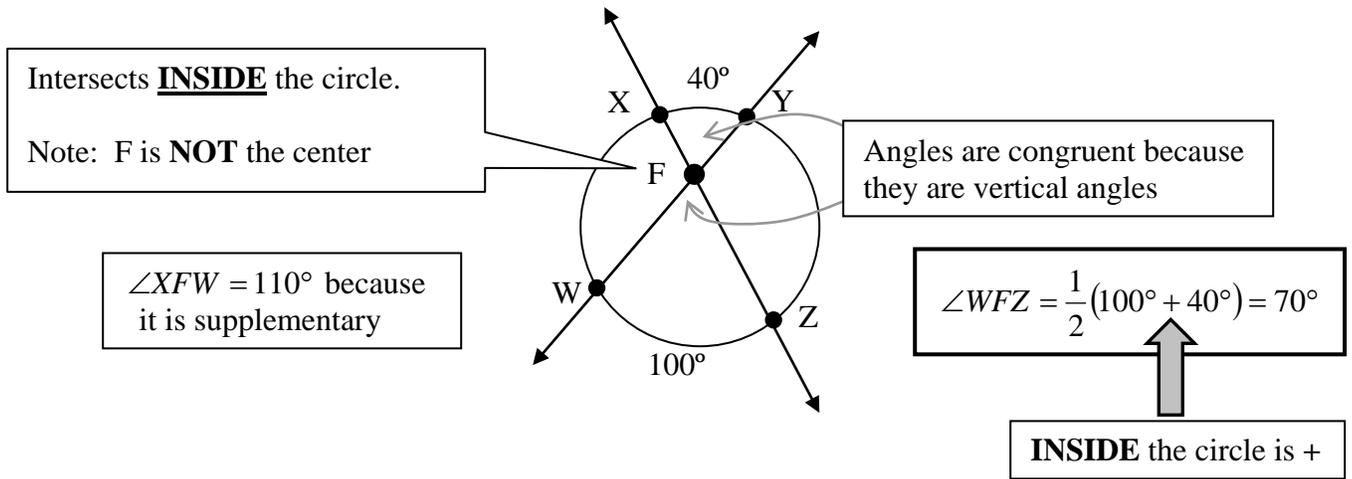


a. $m\angle 1 =$ _____ b. $m\angle 2 =$ _____ c. $m\angle 3 =$ _____ d. $m\angle 4 =$ _____

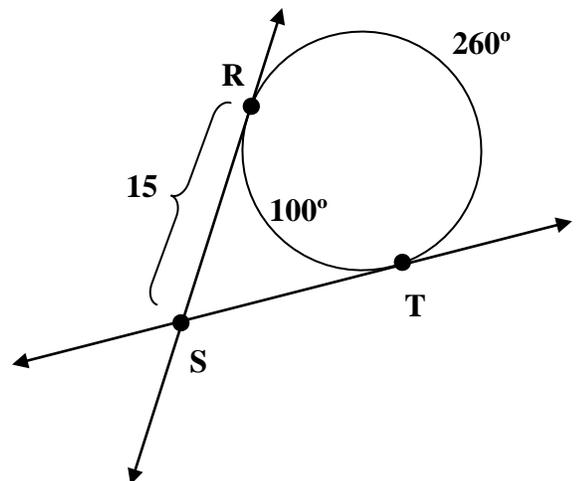
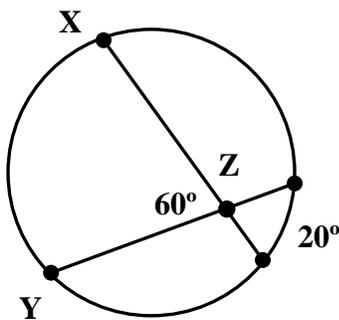
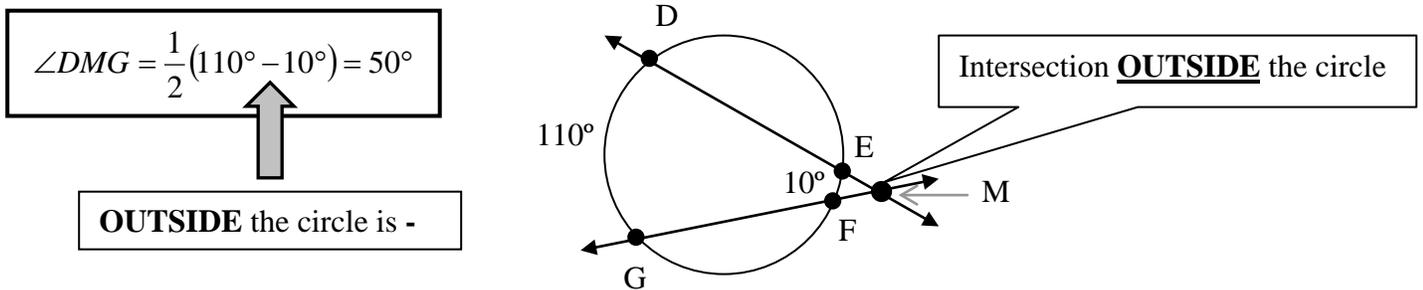
e. $m\angle 5 =$ _____ f. $m\angle 6 =$ _____ g. $m\angle 7 =$ _____ h. $m\angle 8 =$ _____

Finding Angle Measures - Unit 9 Day 5

1. The measure of an angle formed by two secants or chords that intersect in the **interior of a circle** is _____ the _____ of the measures of the arcs intercepted by the angle and its vertical angle.

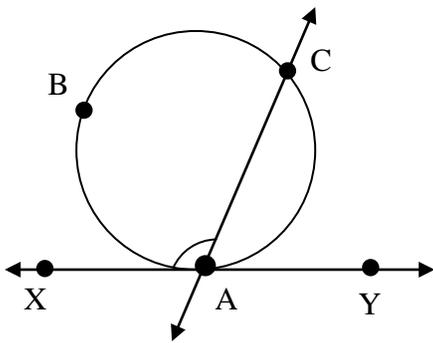


2. The measure of an angle formed in the **exterior of a circle** is _____ the _____ of the measures of the intercepted arcs.



Summary of Angles...

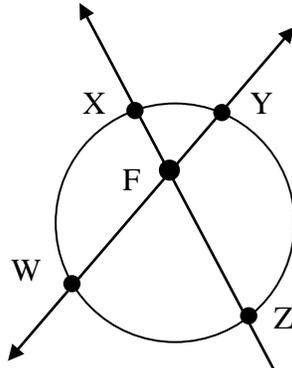
Vertex is on the circle



$$\angle XAB = \frac{1}{2}(\widehat{ABC})$$

$$\angle YAC = \frac{1}{2}(\widehat{AC})$$

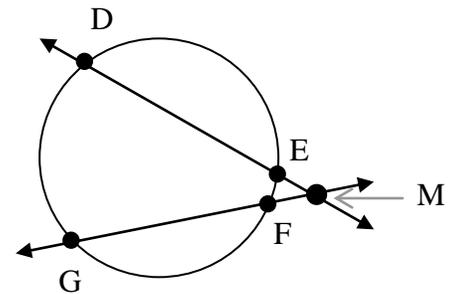
Vertex is inside the circle



$$\angle WFZ = \frac{1}{2}(\widehat{WZ} + \widehat{XY})$$

$$\angle WFX = \frac{1}{2}(\widehat{WX} + \widehat{YZ})$$

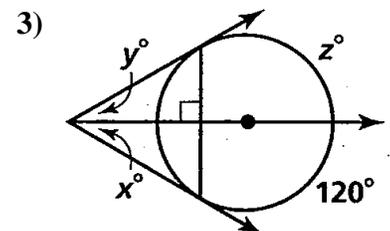
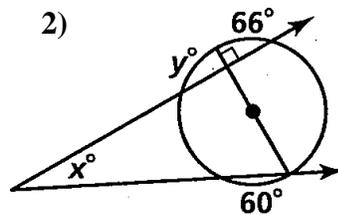
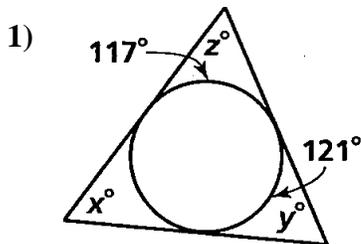
Vertex is outside the circle



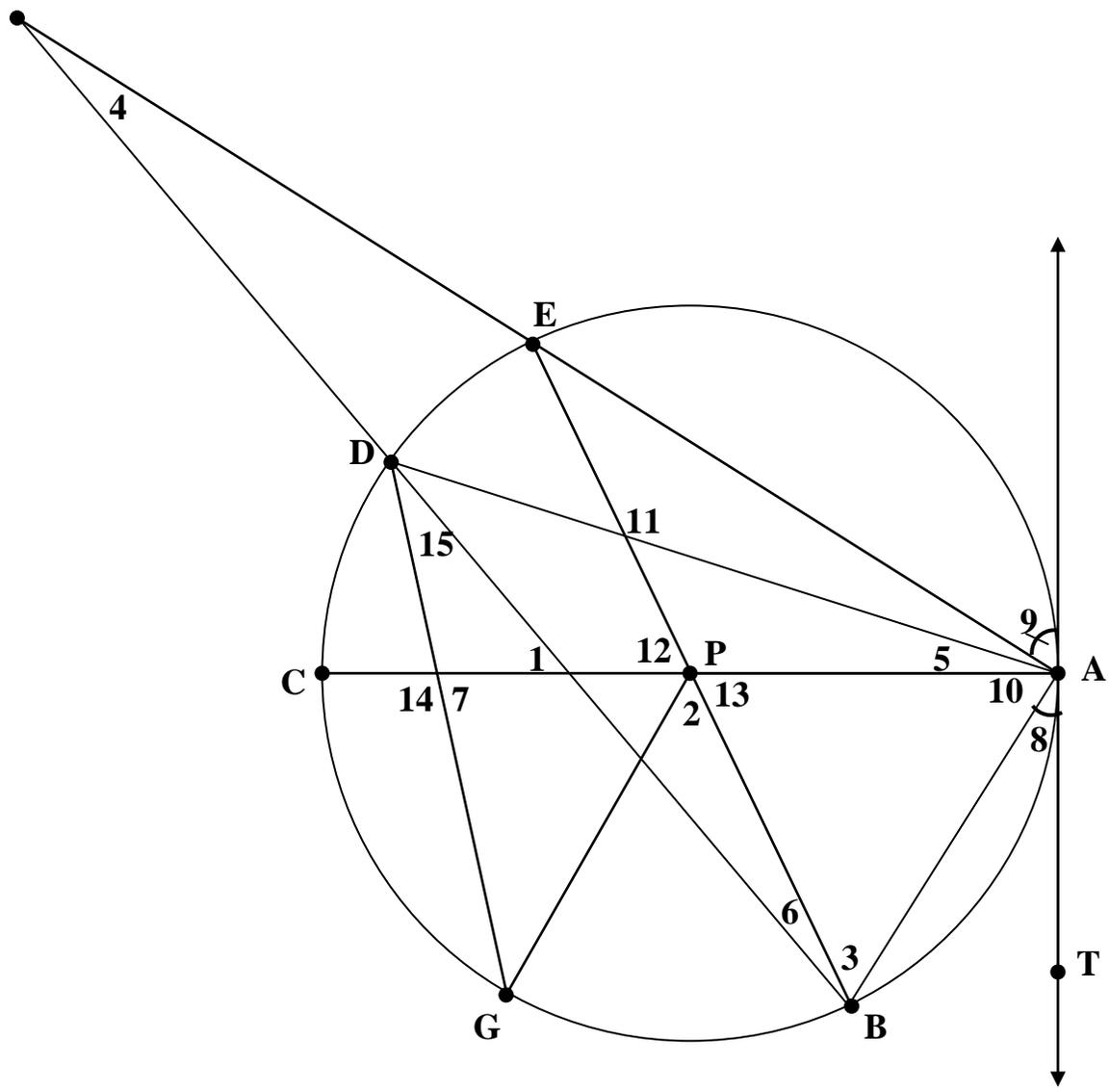
$$\angle DMG = \frac{1}{2}(\widehat{DG} - \widehat{EF})$$

In the space below, compare and contrast the three properties shown above, as well as the central angle theorem (how does the measure of a central angle compare to the measure of its arc)? Draw pictures if you want...

Directions: Find each missing variable below



In circle P shown below, \overline{AT} is tangent, \overline{EB} and \overline{AC} are diameters, plus $m\widehat{DE} = 50^\circ$, $m\widehat{AB} = 80^\circ$, and $m\widehat{AB} = m\widehat{CG}$.

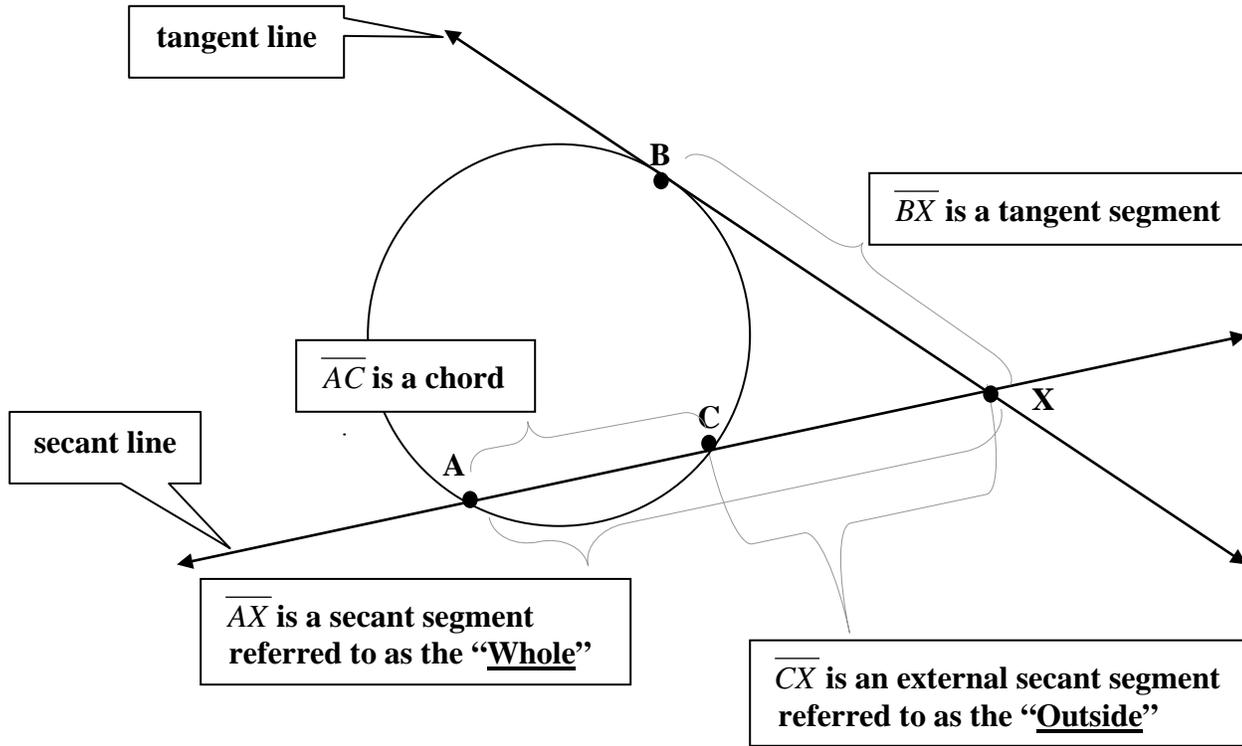


- $m\angle 1 =$ _____
- $m\angle 2 =$ _____
- $m\angle 3 =$ _____
- $m\angle 4 =$ _____
- $m\angle 5 =$ _____
- $m\angle 6 =$ _____
- $m\angle 7 =$ _____
- $m\angle 8 =$ _____
- $m\angle 9 =$ _____
- $m\angle 10 =$ _____
- $m\angle 11 =$ _____
- $m\angle 12 =$ _____
- $m\angle 13 =$ _____
- $m\angle 14 =$ _____
- $m\angle 15 =$ _____

Segment Lengths - Unit 9 Day 6

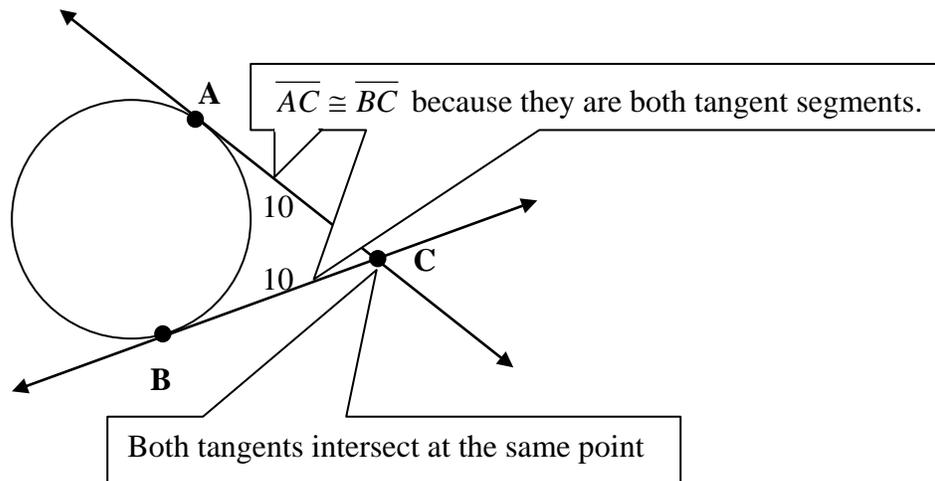
1. We can find the lengths of pieces of chords, secants and tangents...

a. Identifying the different parts of secant and tangent lines.



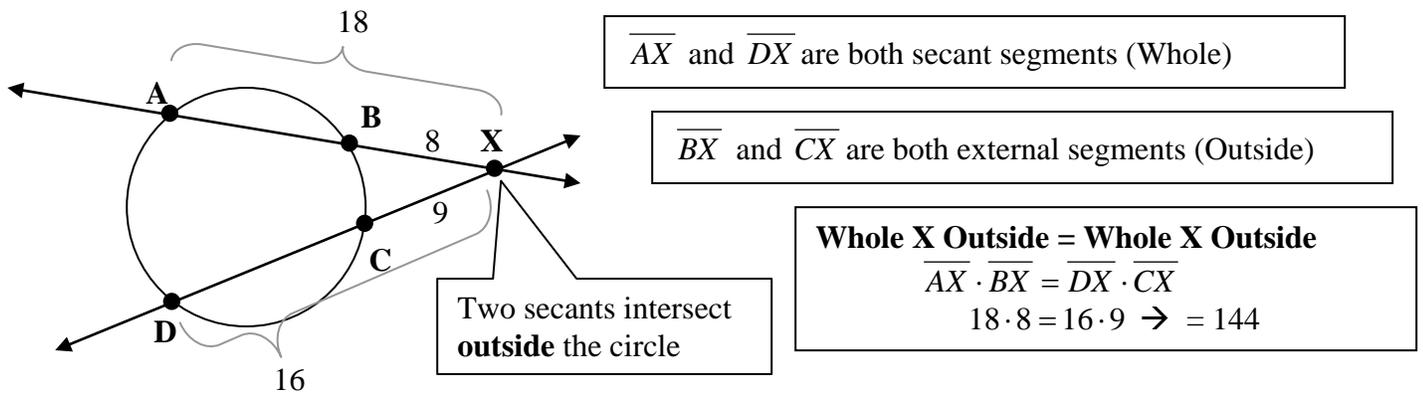
b. Two Tangent Segments Theorem

i. If two segments are tangent to a circle at the same external point, then the segments are congruent (we saw this on day 1 already!)



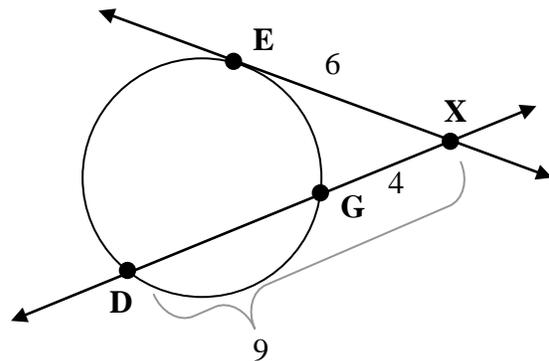
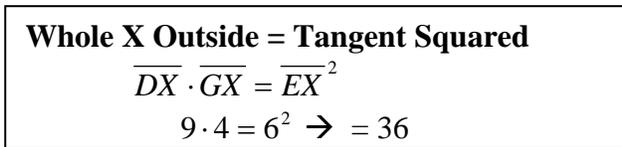
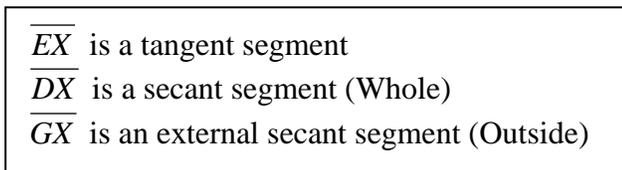
c. Two Secants Theorem

- i. If two secants intersect outside a circle, then the product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segment and its external segment



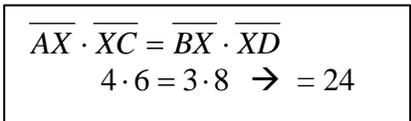
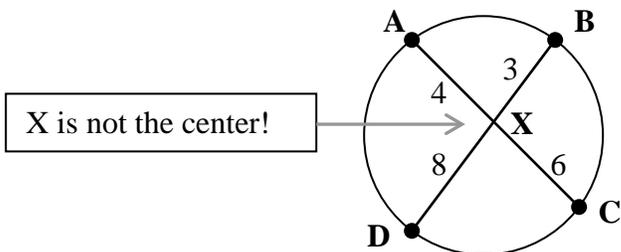
d. Secant and Tangent Theorem

- i. If a secant and a tangent intersect outside a circle, then the product of the lengths of the secant segment and its external segment equals the length of the tangent segment **squared**.

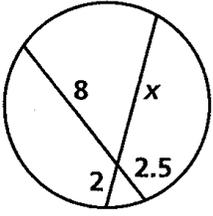


e. Two Chords Theorem

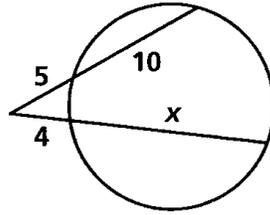
- i. If two chords intersect inside a circle, then the product of the lengths of the segments of one chord equals the product of the lengths of the segments of the other chord.



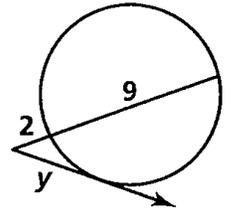
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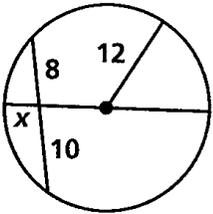
14.



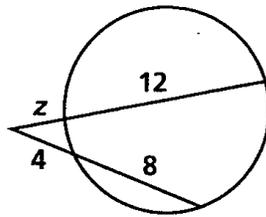
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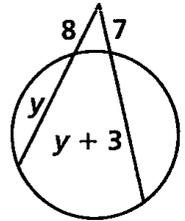
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17.

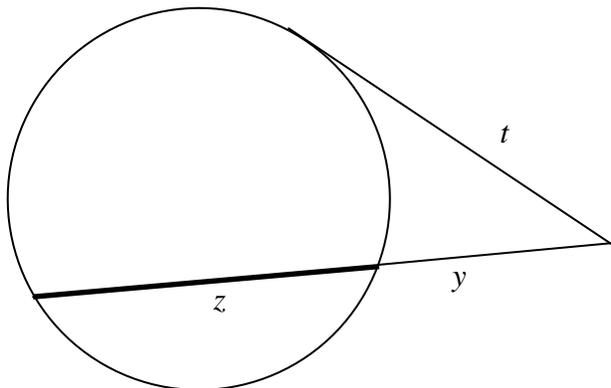
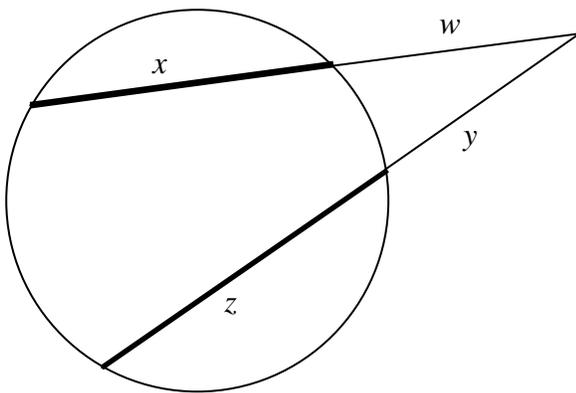
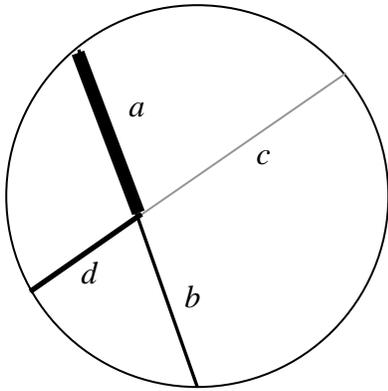


18.



Wrap Up - Summary of Segment Lengths...

Directions: Write formulas, in terms of the letters given, that illustrate the 3 formulas...



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Date _____ Period _____

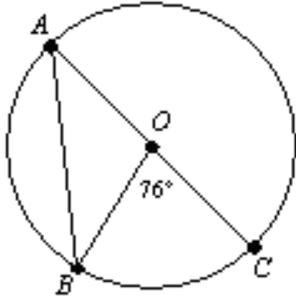
REVIEW!

GEOMETRY H

Unit 9 Review – Unit 9 Day 7

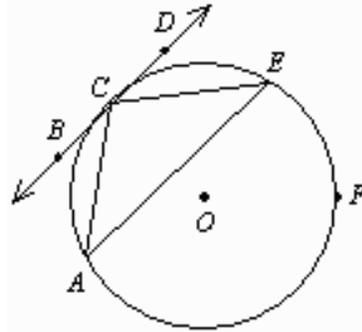
1)

Find $m\angle BAC$

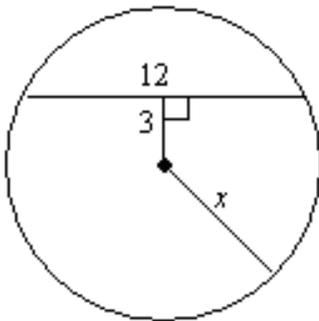


2)

Given: \overline{BD} is tangent to circle O at C ,
 $m\widehat{EFA} = 214^\circ$, $m\angle DCA = 144^\circ$. Find $m\widehat{CE}$

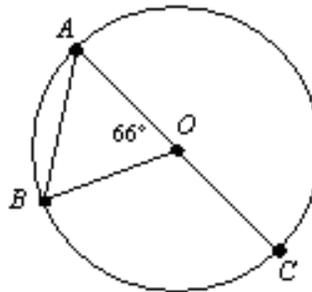


3)

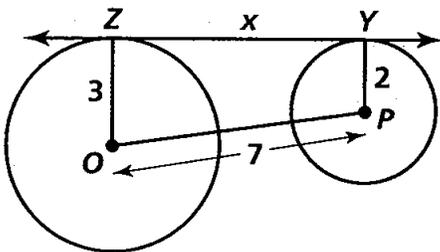


4)

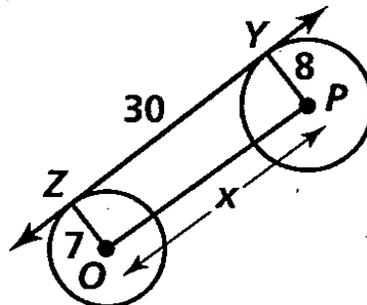
Find $m\angle BAC$

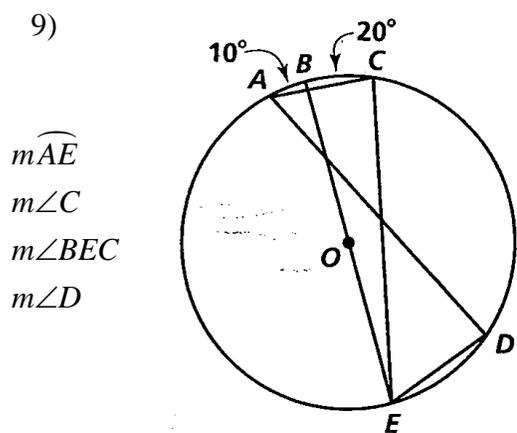
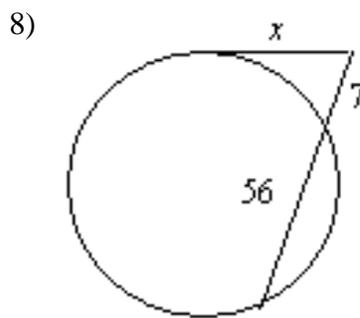
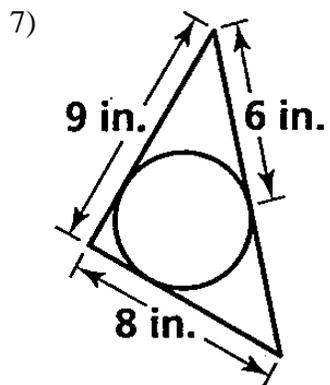


5)

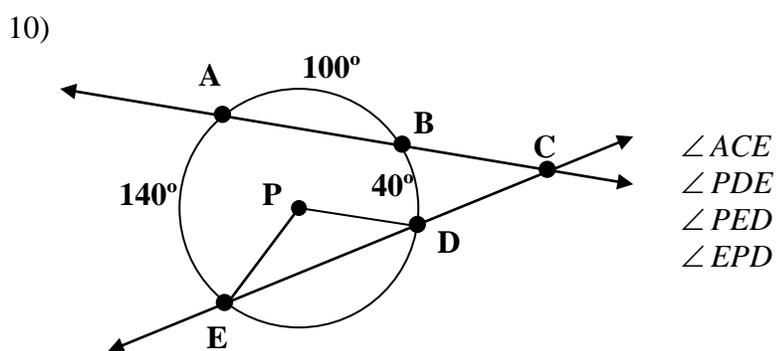


6)

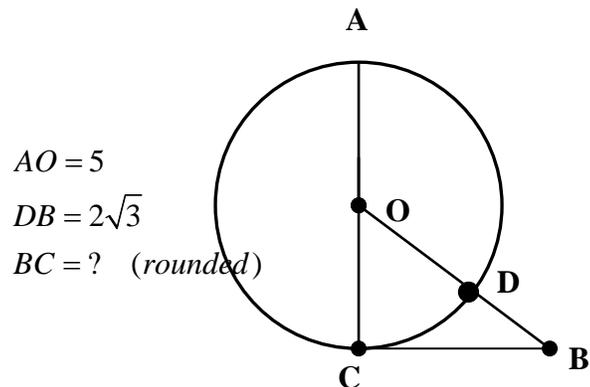




1

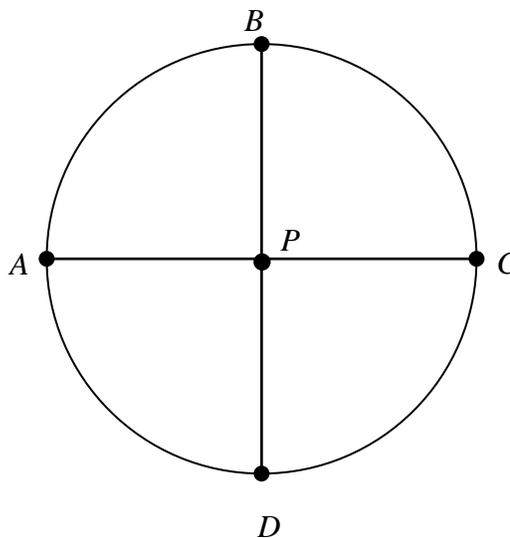


11)



12)

P is the center.
Prove: $\triangle APB \cong \triangle CPD$



NAME _____

Date _____ Period _____

BONUS!

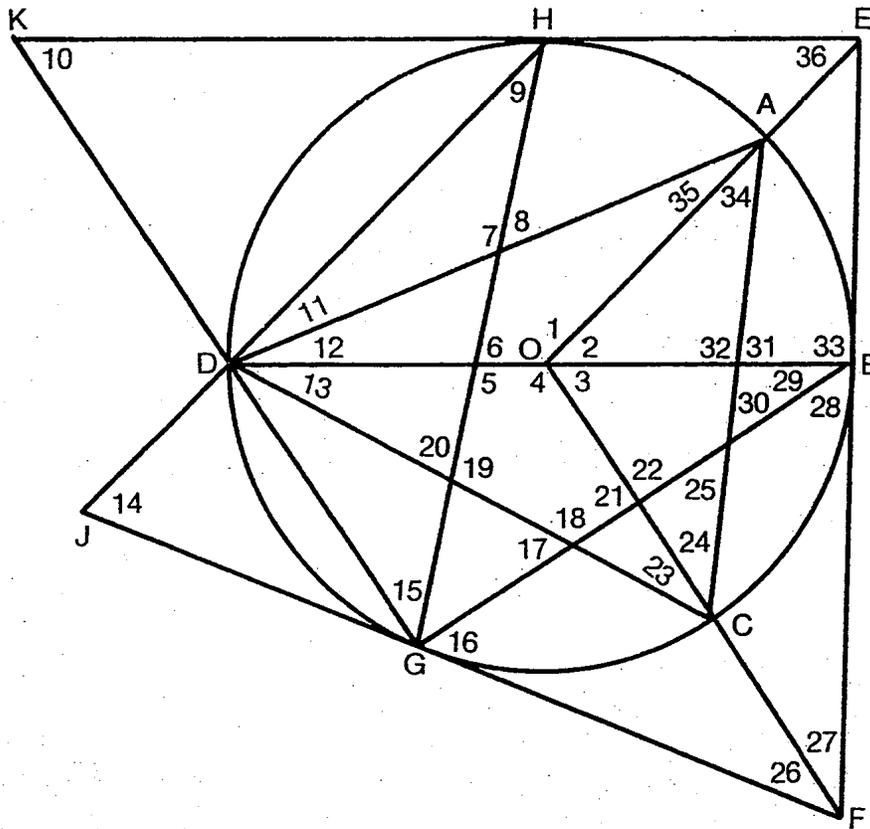
GEOMETRY H

You must get at least 10 angles correct to receive any points

\overline{EF} is tangent to circle O at B; \overline{KE} is tangent at H, and \overline{JF} is tangent at G.

$$m\widehat{AB} = m\widehat{AD}/3 \quad m\widehat{BC} = m\widehat{DC}/2$$

Deduce the measure of each angle listed below.



- | | | | | | |
|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| $\angle 1$ _____ | $\angle 7$ _____ | $\angle 13$ _____ | $\angle 19$ _____ | $\angle 25$ _____ | $\angle 31$ _____ |
| $\angle 2$ _____ | $\angle 8$ _____ | $\angle 14$ _____ | $\angle 20$ _____ | $\angle 26$ _____ | $\angle 32$ _____ |
| $\angle 3$ _____ | $\angle 9$ _____ | $\angle 15$ _____ | $\angle 21$ _____ | $\angle 27$ _____ | $\angle 33$ _____ |
| $\angle 4$ _____ | $\angle 10$ _____ | $\angle 16$ _____ | $\angle 22$ _____ | $\angle 28$ _____ | $\angle 34$ _____ |
| $\angle 5$ _____ | $\angle 11$ _____ | $\angle 17$ _____ | $\angle 23$ _____ | $\angle 29$ _____ | $\angle 35$ _____ |
| $\angle 6$ _____ | $\angle 12$ _____ | $\angle 18$ _____ | $\angle 24$ _____ | $\angle 30$ _____ | $\angle 36$ _____ |