Palsson_Geometry_Circles_Week#2

Student Name:
Teacher Name: Palsson
Class Name/Subject: Geometry
Period:
Assignment Week #: 2
Due date: May 8 (take a photo and email me if you can!)

YOU ONLY NEED TO DO THIS PAPER VERSION WORK IF YOU DO NOT HAVE ACCESS TO INTERNET.
IF YOU DO HAVE ACCESS TO INTERNET, GO TO mpalsson.weebly.com EVERY DAY TO SEE WHAT YOU NEED TO DO.

I RECOMMEND THAT WHEN YOU ARE DONE WITH THIS WORK, TAKE A PHOTO OF YOUR SOLUTIONS AND EMAIL IT TO ME AT mpalsson@tusd.net

THIS WAY YOU WILL GET YOUR GRADE MUCH FASTER THAN IF YOU TURN IN YOUR SOLUTIONS TO THE KHS OFFICE,

Also, feel free to email me if you have any questions.

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1. Central Angle

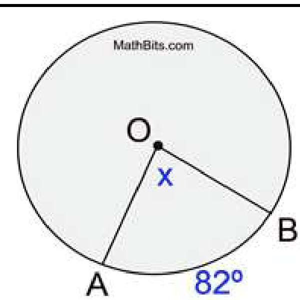
A central angle is an angle formed by two radii with the vertex at the center of the circle.

Central Angle = Intercepted Arc

$$m\angle AOB = m\widehat{AB}$$

In the diagram at the right, $\angle AOB$ is a central angle with an intercepted minor arc from A to B.

$m\angle AOB = 82°$

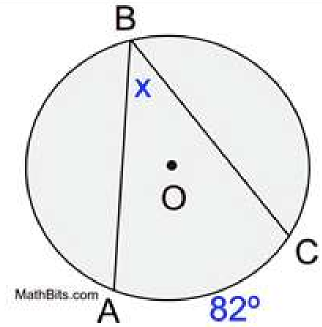


2. Inscribed Angle

An inscribed angle is an angle with its vertex "on" the circle, formed by two intersecting chords.

Inscribed Angle = $\frac{1}{2}$ Intercepted Arc

$$m\angle ABC = \frac{1}{2} m\overset{\frown}{AC}$$



In the diagram at the right, $\angle ABC$ is an inscribed angle with an intercepted minor arc from A to C.

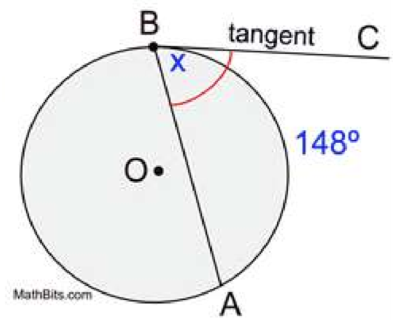
$m\angle ABC = 41°$

3. Tangent Chord Angle

An angle formed by an intersecting tangent and chord has its vertex "on" the circle.

Tangent Chord Angle = $\frac{1}{2}$ Intercepted Arc

$$m\angle ABC = \frac{1}{2}(m\overset{\frown}{AB})$$

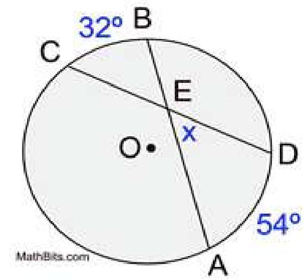


In the diagram at the right, $\angle ABC$ is an angle formed by a tangent and chord with an intercepted minor arc from A to B.

$m\angle ABC = 74°$

4. Angle Formed by Two Intersecting Chords

When two chords intersect inside a circle, four angles are formed. At the point of intersection, two sets of congruent vertical angles are formed in the corners of the X that appears.



Angle Formed by Two Chords

$$= \frac{1}{2}(\textbf{SUM of Intercepted Arcs})$$

$$m\angle AED = \frac{1}{2}(m\overset{\frown}{AD} + m\overset{\frown}{CB})$$

In the diagram at the right, $\angle AED$ is an angle formed by two intersecting chords in the circle. Notice that the intercepted arcs belong to the set of vertical angles.

$$m\angle AED = \frac{1}{2}(54^\circ + 32^\circ) = \frac{1}{2}(86^\circ) = 43^\circ$$

also, $m\angle BEC = 43^\circ$ (vertical angle)

$m\angle CEA$ and $m\angle BED = 137^\circ$ by straight angle formed.

Once you have found ONE of these angles, you automatically know the sizes of the other three by using vertical angles (which are congruent) and adjacent angles forming a straight line (whose measures add to 180°).

5. Angle Formed Outside of Circle by Intersection:

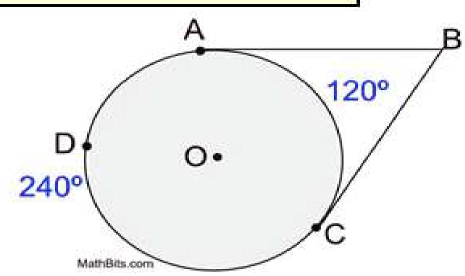
"Two Tangents" or "Two Secants" or a "Tangent and a Secant".

The formulas for all THREE of these situations are the same:

Angle Formed Outside = $\frac{1}{2}$ (**DIFFERENCE** of Intercepted Arcs)

Two Tangents:

$\angle ABC$ is formed by two tangents intersecting outside of circle O. The intercepted arcs are major arc $\overset{\frown}{AC}$ and minor arc $\overset{\frown}{AC}$. These two arcs together comprise the entire circle.



Angle Formed by Two Tangents

$$= \frac{1}{2}(\textbf{DIFFERENCE of Intercepted Arcs})$$

$$m\angle ABC = \frac{1}{2}(m\overset{\frown}{ADC}_{\text{major}} - m\overset{\frown}{AC}_{\text{minor}})$$

(When subtracting, start with the larger arc.)

$$m\angle ABC = \frac{1}{2}(240^\circ - 120^\circ)$$

$$= \frac{1}{2}(120^\circ) = 60^\circ$$

Note: It can be proven that $\angle ABC$ and central angle $\angle AOC$ are supplementary. Thus the angle formed by the two tangents and the degree measure of the first minor intercepted arc also add to 180°

Example 1: Applying the Chord-Chord Product Theorem

Find the value of *x* and the length of each chord.

$EJ \bullet JF = GJ \bullet JH$

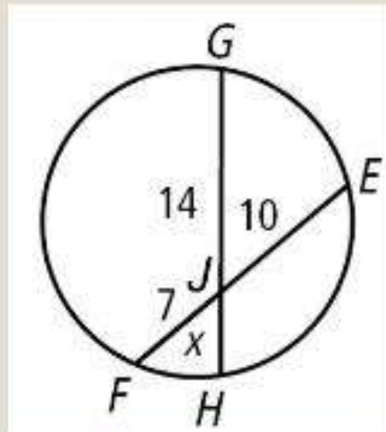
$10(7) = 14(x)$

$70 = 14x$

$5 = x$

$EF = 10 + 7 = 17$

$GH = 14 + 5 = 19$



Example 3: Applying the Secant-Secant Product Theorem

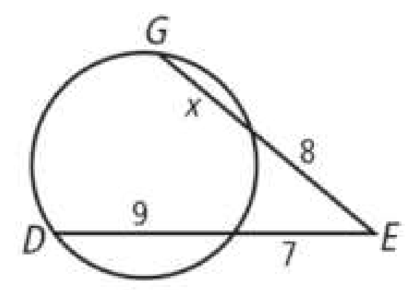
Find the value of *x* and the length of each secant segment.

$16(7) = (8 + x)8$

$112 = 64 + 8x$

$48 = 8x$

$6 = x$



$ED = 7 + 9 = 16$

$EG = 8 + 6 = 14$

Look at the examples above when you solve the problems below.

Find the measure of the arc or central angle indicated. Assume that lines which appear to be diameters are actual diameters.

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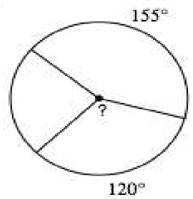

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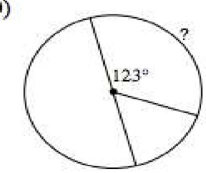

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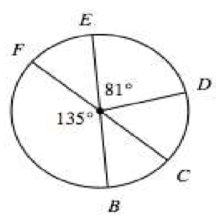
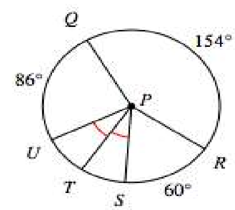
11) $m\overset{\frown}{CFD}$

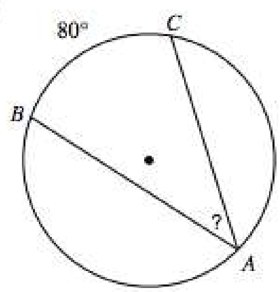


12) $m\angle SPQ$



Find the measure of the arc or angle indicated.

5)



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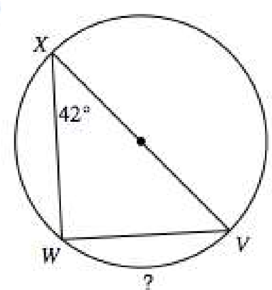

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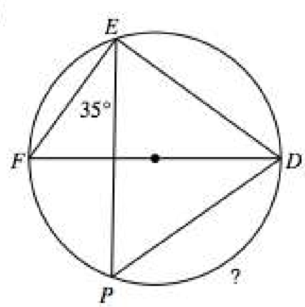

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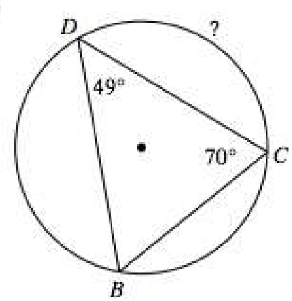
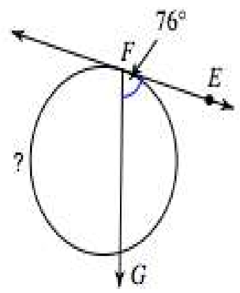


Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

1)



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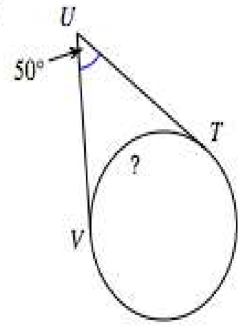

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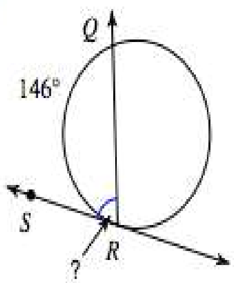

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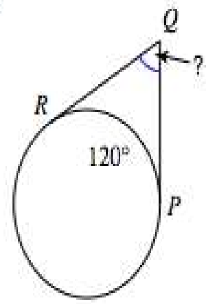

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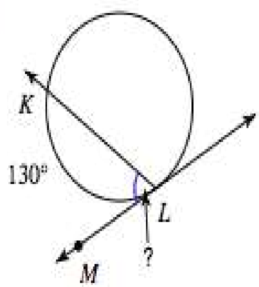

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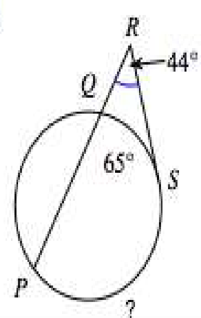
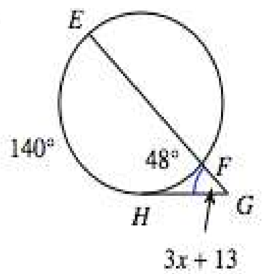


Solve for x. Assume that lines which appear tangent are tangent.

9)



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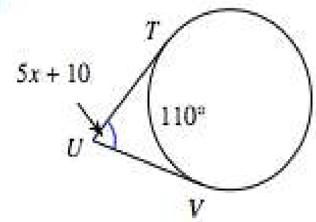

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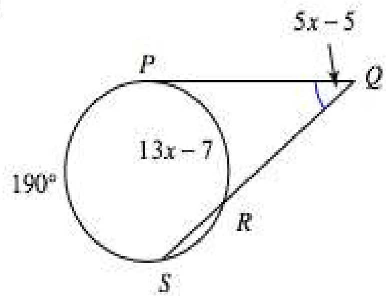

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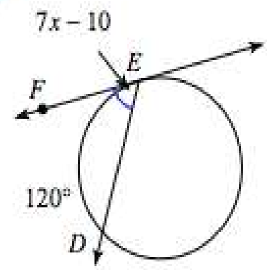

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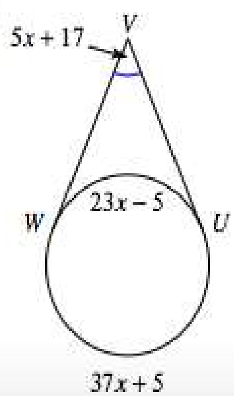

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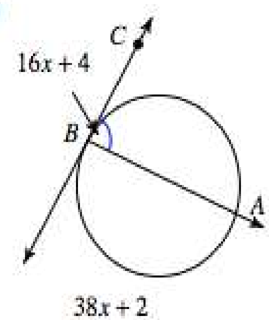

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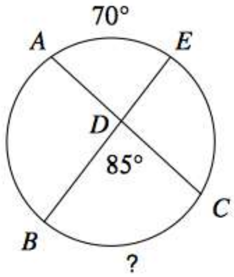

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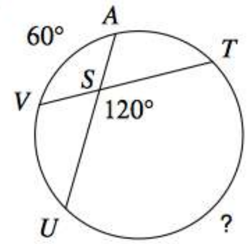

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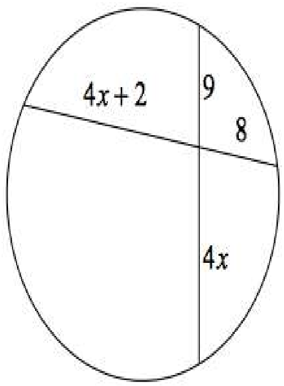

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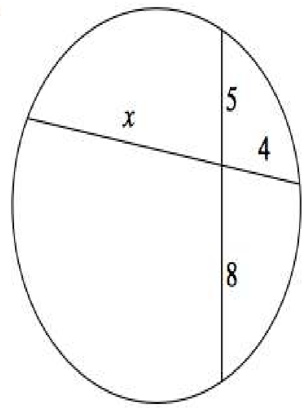

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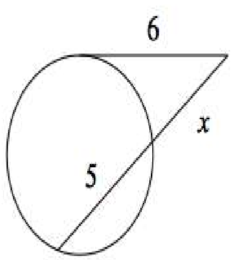

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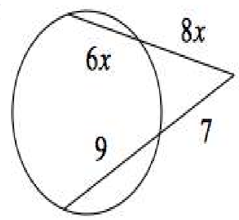
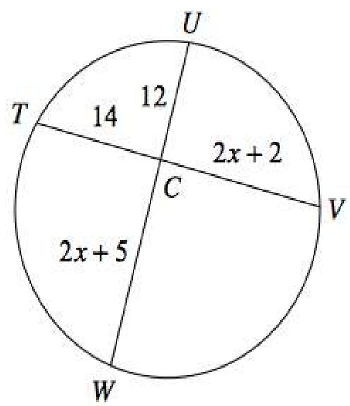
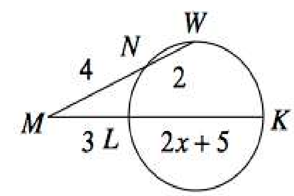


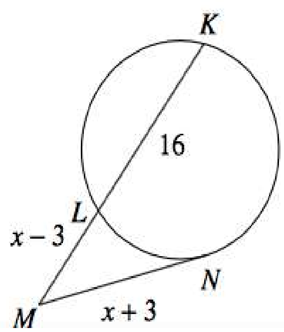
9) Find UW



10) Find KM



11) Find NM



12) Find NL