Monday, November 17, 2014

WARM UP

1. Draw a diagram showing two triangles are similar using the ASA similarity Theorem

2. Draw a diagram showing two triangles are congruent using the AAS Theorem.

3. If an inscribed angle cuts an arc of 120^o on a circle, what is the measure of the inscribed angle?

Objectives

- Use properties external angles to determine the measure of intercepted arcs.
- Use properties of Chords and Secants to determine segment length
- Solve real world problems involving circles.

Homework

Circle Packet, Sections IV, V and VI (4, 5, and 6 ☺)

ALL Retakes for the Log and Exponents Unit must be completed by Friday November 21st.
No exceptions.

You **MUST** bring your test corrections with you to be eligible for a retake.

CIRCLES Quiz Wednesday

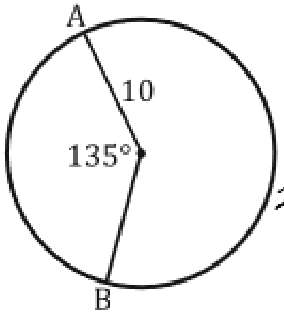
UNIT TEST THIS FRIDAY

New location for Monday afternoon tutoring! **MC 1114**

Check your homework

Calculate the length of each arc...

1.



$\frac{135°}{360°} = \frac{3}{8}$

$C = 2\pi r$

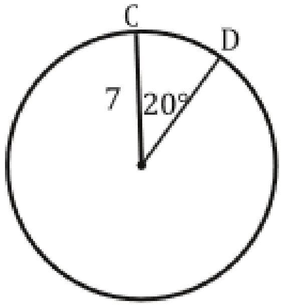
$C = 2\pi 10$

$C = 20\pi$

$20\pi * \frac{3}{8} = \frac{60\pi}{8} =$

$\frac{15\pi}{2} \approx 23.56$

2.



$\frac{20°}{360°} = \frac{1}{18}$

$C = 2\pi r$

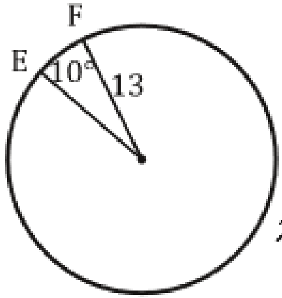
$C = 2\pi 7$

$C = 14\pi$

$14\pi * \frac{1}{18} = \frac{14\pi}{18} =$

$\frac{7\pi}{9} \approx 2.44$

3.



$\frac{10°}{360°} = \frac{1}{36}$

$C = 2\pi r$

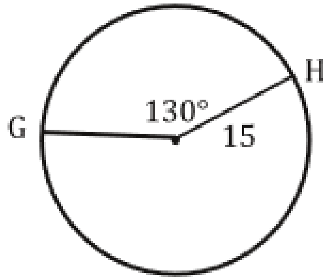
$C = 2\pi 13$

$C = 26\pi$

$26\pi * \frac{1}{36} = \frac{26\pi}{36} =$

$\frac{13\pi}{18} \approx 2.27$

4.



$\frac{130°}{360°} = \frac{13}{36}$

$C = 2\pi r$

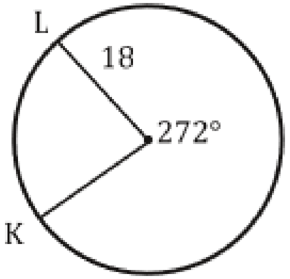
$C = 2\pi 15$

$C = 30\pi$

$30\pi * \frac{13}{36} = \frac{390\pi}{36} =$

$\frac{65\pi}{6} \approx 34.03$

5.



$\frac{272°}{360°} = \frac{34}{45}$

$C = 2\pi r$

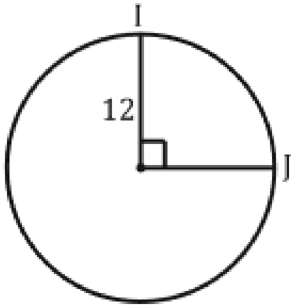
$C = 2\pi 18$

$C = 36\pi$

$36\pi * \frac{34}{45} = \frac{1224\pi}{45} =$

$\frac{136\pi}{5} \approx 85.45$

6.



$\frac{90°}{360°} = \frac{1}{4}$

$C = 2\pi r$

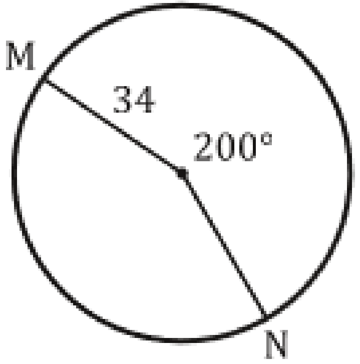
$C = 2\pi 12$

$C = 24\pi$

$24\pi * \frac{1}{4} = \frac{24\pi}{4} =$

$6\pi \approx 18.85$

7.



$\frac{200°}{360°} = \frac{5}{9}$

$C = 2\pi r$

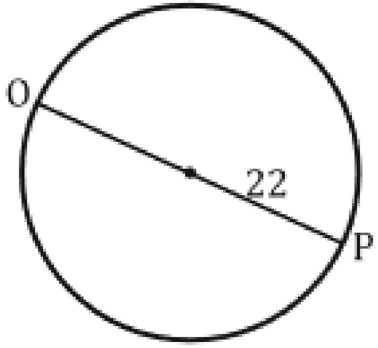
$C = 2\pi 34$

$C = 68\pi$

$68\pi * \frac{5}{9} = \frac{340\pi}{9} =$

$\frac{340\pi}{9} \approx 118.68$

8.



$\frac{180°}{360°} = \frac{1}{2}$

$C = 2\pi r$

$C = 2\pi 22$

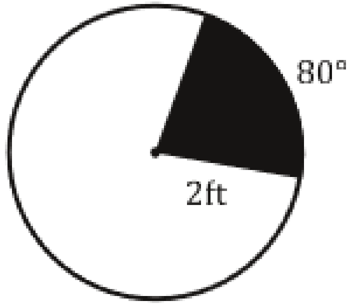
$C = 44\pi$

$44\pi * \frac{1}{2} = \frac{44\pi}{2} =$

$22\pi \approx 69.12$

Find the area of each shaded sector...

9.



$\frac{80°}{360°} = \frac{2}{9}$

$C = \pi r^2$

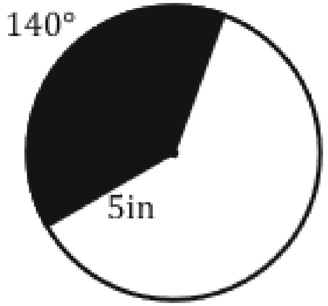
$C = \pi 2^2$

$C = 4\pi$

$4\pi * \frac{2}{9} = \frac{8\pi}{9} =$

$\frac{8\pi}{9} \approx 2.79 ft^2$

10.



$\frac{140°}{360°} = \frac{7}{18}$

$C = \pi r^2$

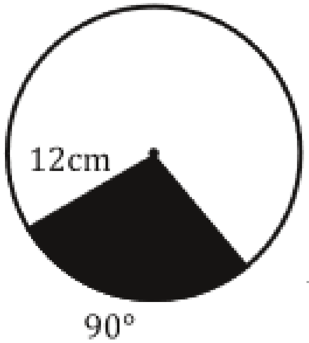
$C = \pi 5^2$

$C = 25\pi$

$25\pi * \frac{7}{18} = \frac{175\pi}{18} =$

$\frac{175\pi}{18} \approx 30.54 in^2$

11.



$\frac{90°}{360°} = \frac{1}{4}$

$C = \pi r^2$

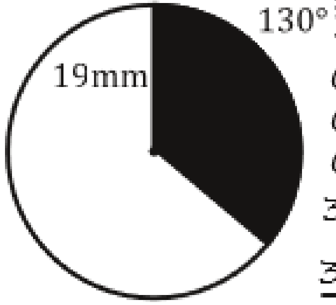
$C = \pi 12^2$

$C = 144\pi$

$144\pi * \frac{1}{4} = \frac{144\pi}{4} =$

$\frac{144\pi}{4} \approx 113.1 cm^2$

12.



$\frac{130°}{360°} = \frac{13}{36}$

$C = \pi r^2$

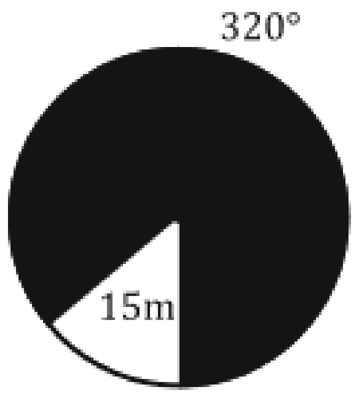
$C = \pi 19^2$

$C = 361\pi$

$361\pi * \frac{1}{36} = \frac{361\pi}{36} =$

$\frac{361\pi}{36} \approx 31.50 mm^2$

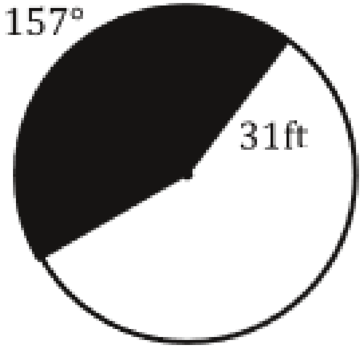
13.



$$\frac{320°}{360°}=\frac{8}{9}$$

$$C=\pi r^2$$
$$C=\pi 15^2$$
$$C=225\pi$$
$$225\pi * \frac{8}{9}=\frac{1800\pi}{9}=$$
$$200\pi \approx 628.32m^2$$

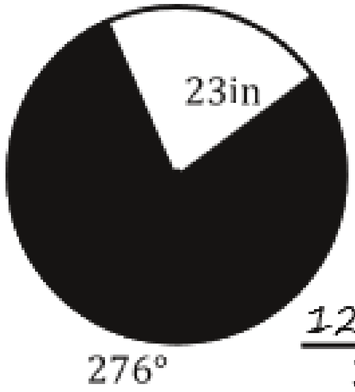
14.



$$\frac{157°}{360°}=\frac{157}{360}$$

$$C=\pi r^2$$
$$C=\pi 31^2$$
$$C=961\pi$$
$$961\pi * \frac{157}{360}=\frac{7688\pi}{360}=$$
$$\frac{961\pi}{45}\approx 67.09ft^2$$

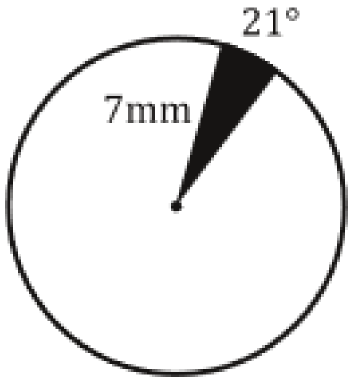
15.



$$\frac{276°}{360°}=\frac{23}{30}$$

$$C=\pi r^2$$
$$C=\pi 23^2$$
$$C=529\pi$$
$$529\pi * \frac{23}{30}=\frac{12167\pi}{30}=$$
$$\frac{12167\pi}{30}\approx 1274.13in^2$$

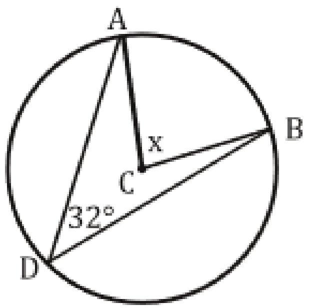
16.



$$\frac{21°}{360°}=\frac{7}{120}$$

$$C=\pi r^2$$
$$C=\pi 7^2$$
$$C=49\pi$$
$$49\pi * \frac{7}{120}=\frac{343\pi}{120}=$$
$$\frac{343\pi}{120}\approx 8.98mm^2$$

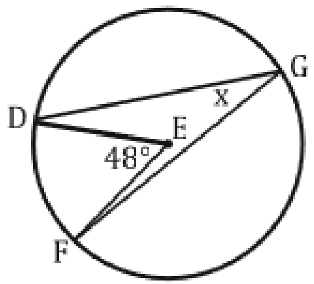
9.



$2(m\angle D)=m\overset{\frown}{AB}$
$2(32°)=m\overset{\frown}{AB}$
$64°=m\overset{\frown}{AB}$

$m\angle C=m\overset{\frown}{AB}$
$x=64°$

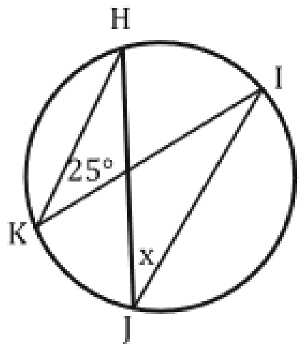
10.



$m\angle E=m\overset{\frown}{DF}$
$48°=m\overset{\frown}{DF}$

$m\angle G=1/2m\overset{\frown}{DF}$
$x=1/2(48°)$
$x=24°$

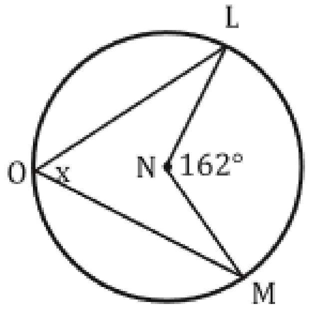
11.



$2(m\angle K)=m\overset{\frown}{HI}$
$2(25°)=m\overset{\frown}{HI}$
$50°=m\overset{\frown}{HI}$

$m\angle J=1/2m\overset{\frown}{DF}$
$x=1/2(50°)$
$x=25°$

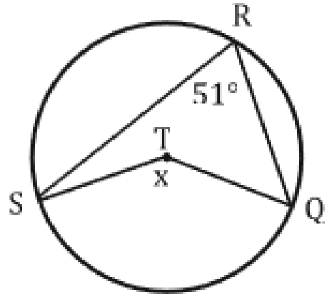
12.



$m\angle N=m\overset{\frown}{LM}$
$162°=m\overset{\frown}{LM}$

$m\angle G=1/2m\overset{\frown}{LM}$
$x=1/2(162°)$
$x=81°$

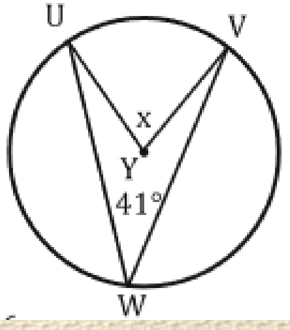
13.



$2(m\angle R)=m\overset{\frown}{QS}$
$2(51°)=m\overset{\frown}{QS}$
$102°=m\overset{\frown}{QS}$

$m\angle T=m\overset{\frown}{QS}$
$x=102°$

14.



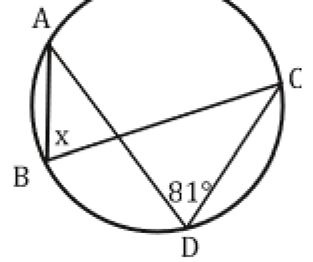
$2(m\angle W)=m\overset{\frown}{UV}$
$2(41°)=m\overset{\frown}{UV}$
$82°=m\overset{\frown}{UV}$

$m\angle Y=m\overset{\frown}{UV}$
$x=82°$

15.

16.

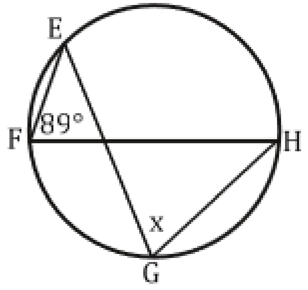
15.



$2(m\angle D)=m\overparen{AC}$
$2(81°)=m\overparen{AC}$
$162°=m\overparen{AC}$

$m\angle B=1/2m\overparen{AC}$
$x=1/2(162°)$
$x=81°$

16. W

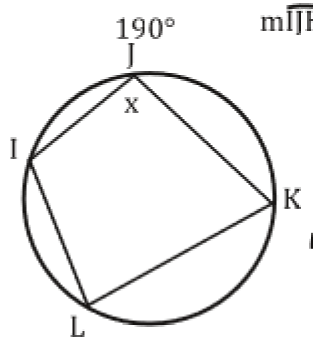


$2(m\angle F)=m\overparen{EH}$
$2(89°)=m\overparen{EH}$
$178°=m\overparen{EH}$

$m\angle G=1/2m\overparen{EH}$
$x=1/2(178°)$
$x=89°$

274

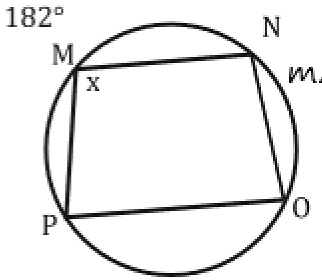
17. $m\overparen{IJK}=190°$



First find $m\overparen{KLI}$.
$m\overparen{IJK}+m\overparen{KLI}=360°$
$m\overparen{IJK}+m\overparen{KLI}=360°$
$190°+m\overparen{KLI}=360°$
$-190° \qquad -190°$
$m\overparen{KLI}=170°$

Then find $m\angle J$.
$m\angle J=1/2m\overparen{KLI}$
$x=1/2(170°)$
$x=85°$

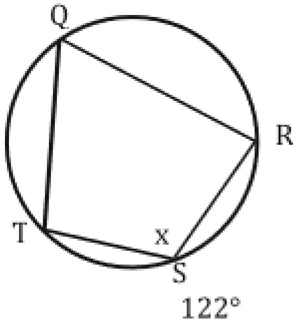
18. $m\overparen{PMN}=182°$



$m\overparen{PMN}+m\overparen{NOP}=360°$
$182°+m\overparen{KJL}=360°$
$-182° \qquad -182°$
$m\overparen{NOP}=178°$

$m\angle M=1/2m\overparen{NOP}$
$x=1/2(178°)$
$x=89°$

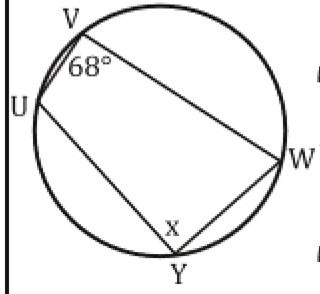
19. $m\overparen{RST}=122°$



$m\overparen{RST}+m\overparen{TQR}=360°$
$122°+m\overparen{TQR}=360°$
$-122° \qquad -122°$
$m\overparen{TQR}=238°$

$m\angle S=1/2m\overparen{TQR}$
$x=1/2(238°)$
$x=119°$

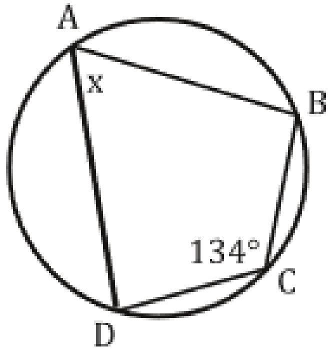
20. First find $m\overparen{UYW}$.



$2(m\angle V)=m\overparen{UYW}$
$2(68°)=m\overparen{UYW}$
$136°=m\overparen{UYW}$
$m\overparen{UYW}+m\overparen{UVW}=360°$
$136°+m\overparen{UVW}=360°$
$-136° \qquad -136°$
$m\overparen{UVW}=224°$

$m\angle Y=1/2m\overparen{UVW}$
$x=1/2(224°)$
$x=112°$

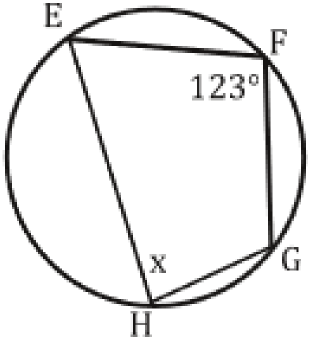
21.



$2(m\angle C) = m\overset{\frown}{DAB}$
$2(134°) = m\overset{\frown}{DAB}$
$268° = m\overset{\frown}{DAB}$
$m\overset{\frown}{DAB} + m\overset{\frown}{DCB} = 360°$
$268° + m\overset{\frown}{DCB} = 360°$
$-268° \qquad -268°$
$m\overset{\frown}{DCB} = 92°$

$m\angle A = 1/2\, m\overset{\frown}{DCB}$
$x = 1/2(92°)$
$x = 46°$

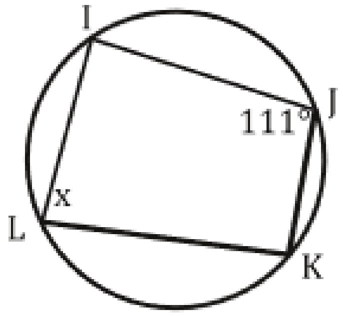
22.



$2(m\angle F) = m\overset{\frown}{EHG}$
$2(123°) = m\overset{\frown}{EHG}$
$246° = m\overset{\frown}{EHG}$
$m\overset{\frown}{EHG} + m\overset{\frown}{EFG} = 360°$
$246° + m\overset{\frown}{EFG} = 360°$
$-246° \qquad -246°$
$m\overset{\frown}{EFG} = 114°$

$m\angle H = 1/2\, m\overset{\frown}{EFG}$
$x = 1/2(114°)$
$x = 57°$

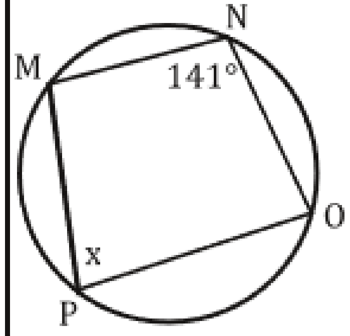
23.



$2(m\angle J) = m\overset{\frown}{ILK}$
$2(111°) = m\overset{\frown}{ILK}$
$222° = m\overset{\frown}{ILK}$
$m\overset{\frown}{ILK} + m\overset{\frown}{IJK} = 360°$
$222° + m\overset{\frown}{IJK} = 360°$
$-222° \qquad -222°$
$m\overset{\frown}{IJK} = 138°$

$m\angle A = 1/2\, m\overset{\frown}{DCB}$
$x = 1/2(138°)$
$x = 69°$

24.

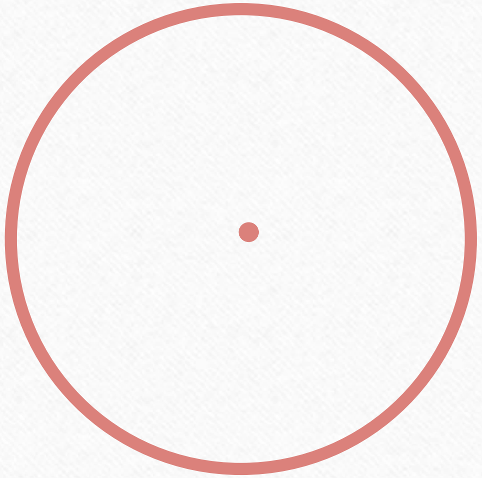


$2(m\angle N) = m\overset{\frown}{MPO}$
$2(141°) = m\overset{\frown}{MPO}$
$282° = m\overset{\frown}{MPO}$
$m\overset{\frown}{MPO} + m\overset{\frown}{MNO} = 360°$
$282° + m\overset{\frown}{MNO} = 360°$
$-282° \qquad -282°$
$m\overset{\frown}{MNO} = 78°$

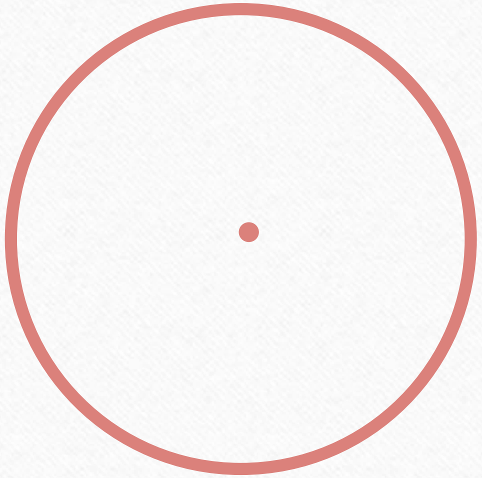
$m\angle H = 1/2\, m\overset{\frown}{MNO}$
$x = 1/2(78°)$
$x = 39°$

To Summarize our adventures from yesterday…

Central
Angle



Inscribed
Angle



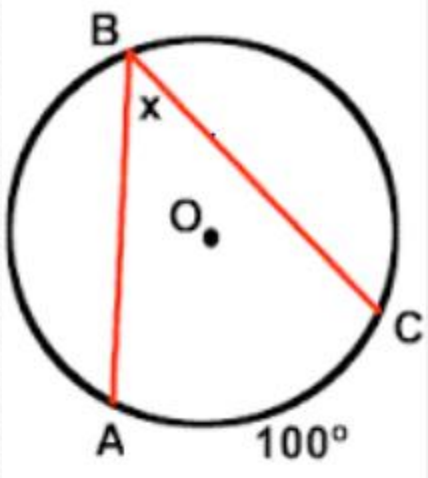
Intersecting
Chord
Angles

Tangent
Angle

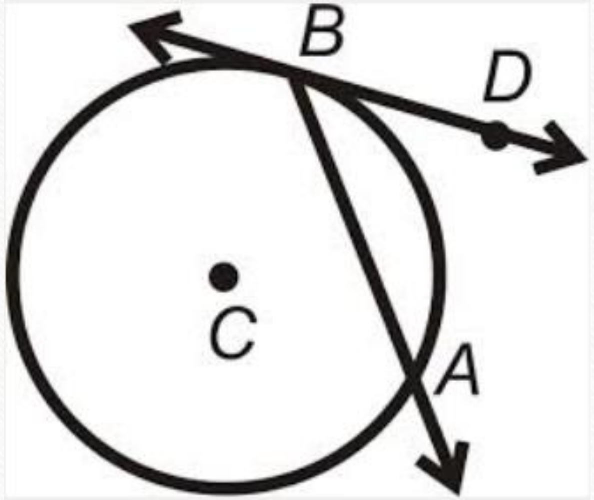
Yesterday, all our troubles seemed so far away.

What do the angles pictured below have in common?

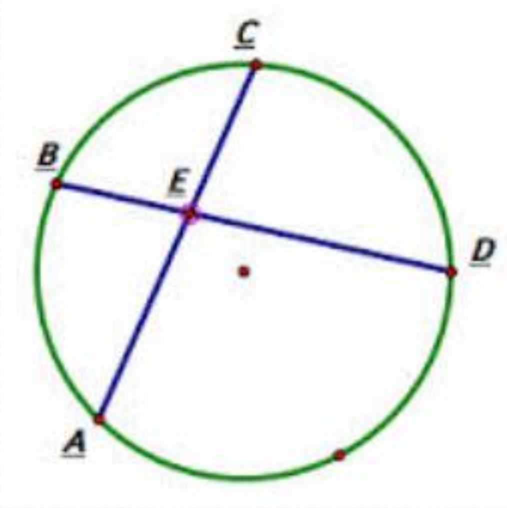
The angles are formed inside the circle.



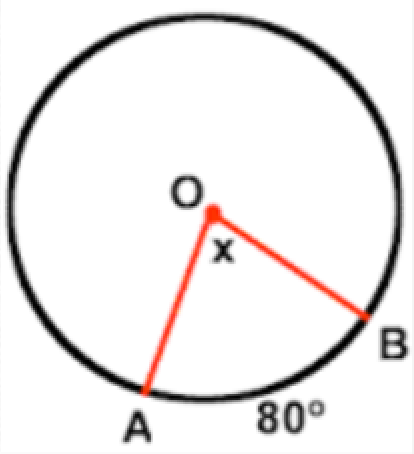
Inscribed angle



Tangent angle

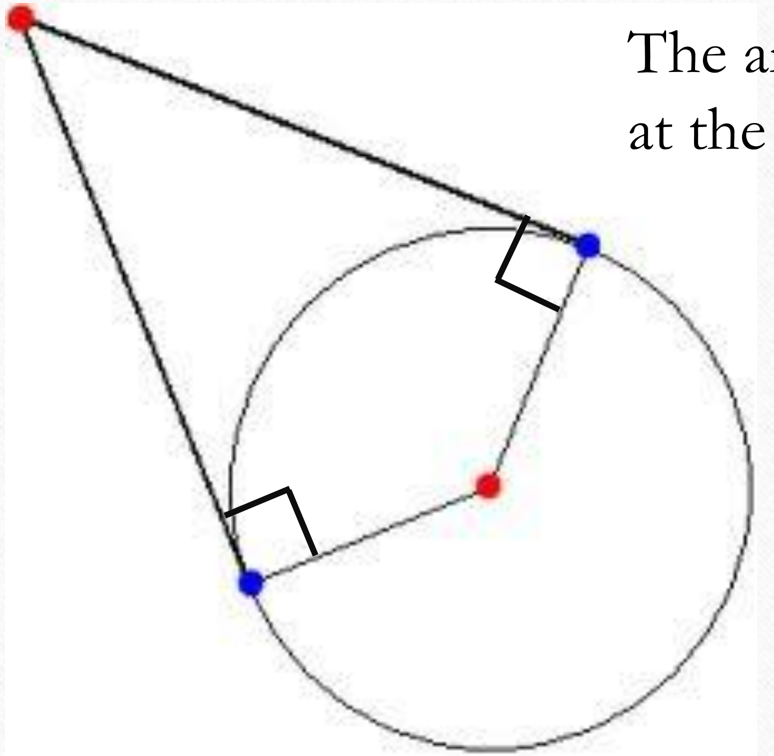


Intersecting Chords



Central Angle

One more thing about tangents and circles.



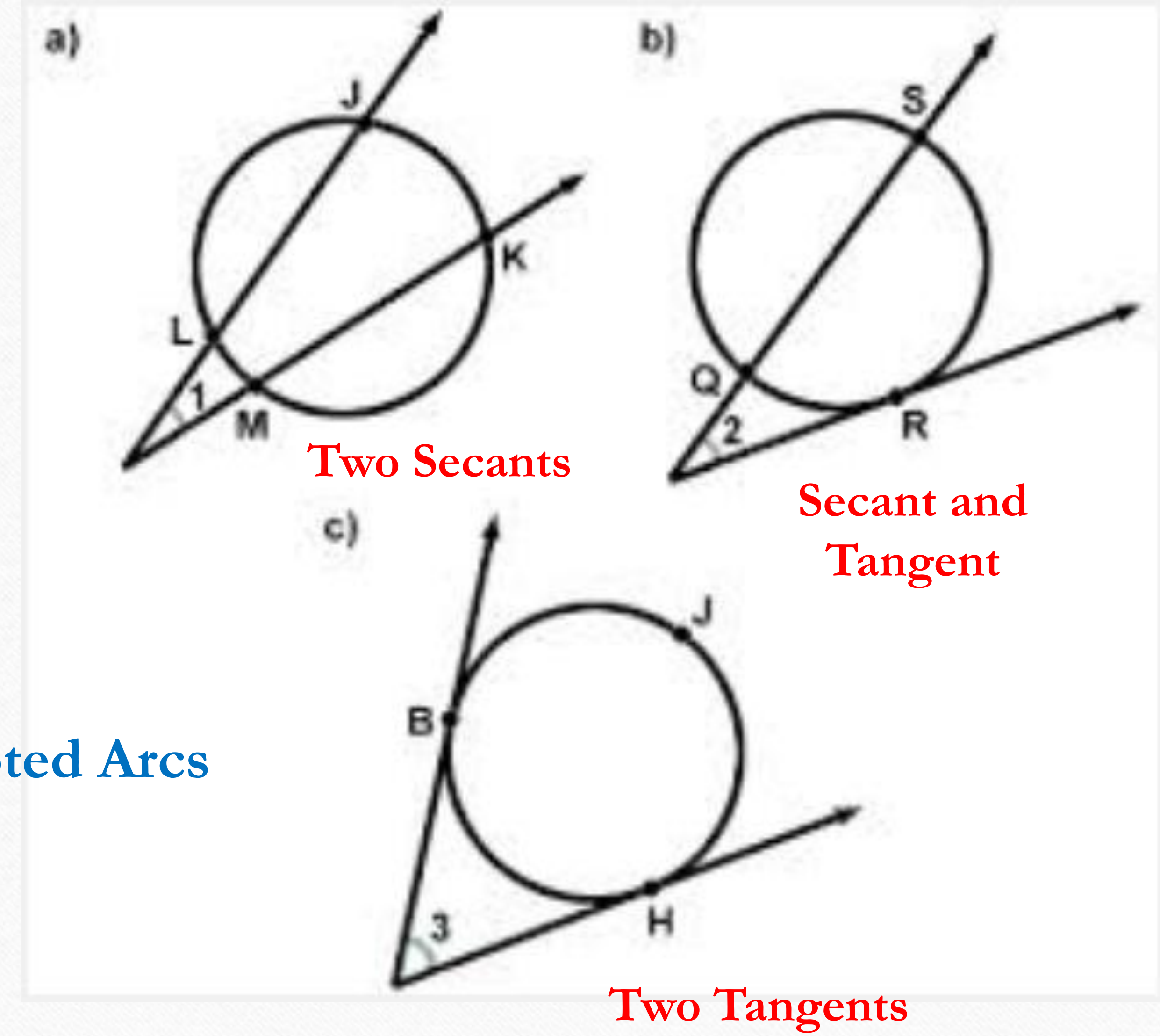
The angle formed with the tangent line and the radius at the point of tangency is a right angle. ALWAYS.

What's different about the angles pictured here?

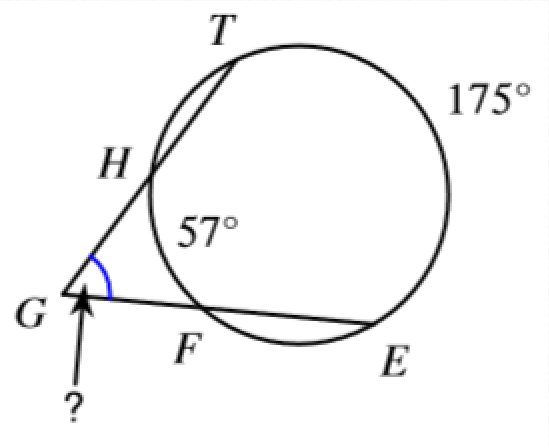
Angles are formed out side of the circle.

Angle Formed Outside

$$= \frac{1}{2} \text{ Difference of Intercepted Arcs}$$



Angle Formed Outside $= \frac{1}{2}$ Difference of Intercepted Arcs

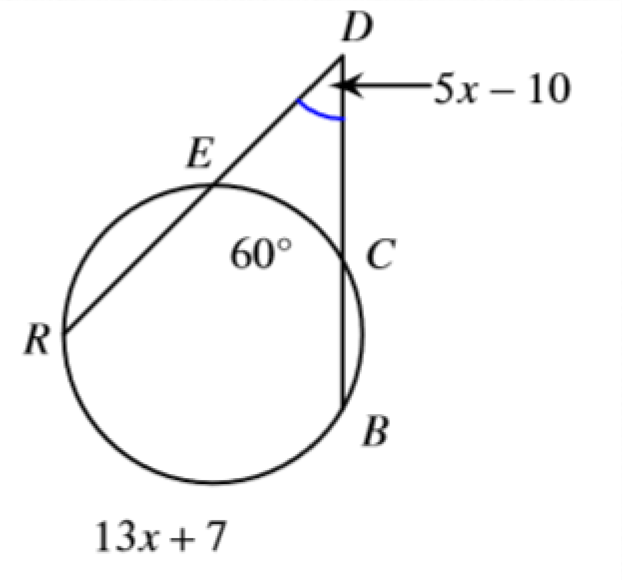


$$\angle G = \frac{1}{2}(\widehat{TE} - \widehat{HF})$$

$$\angle G = \frac{1}{2}(175 - 57)$$

$$\angle G = \frac{1}{2}(175 - 57)$$

$$\angle G = 59$$



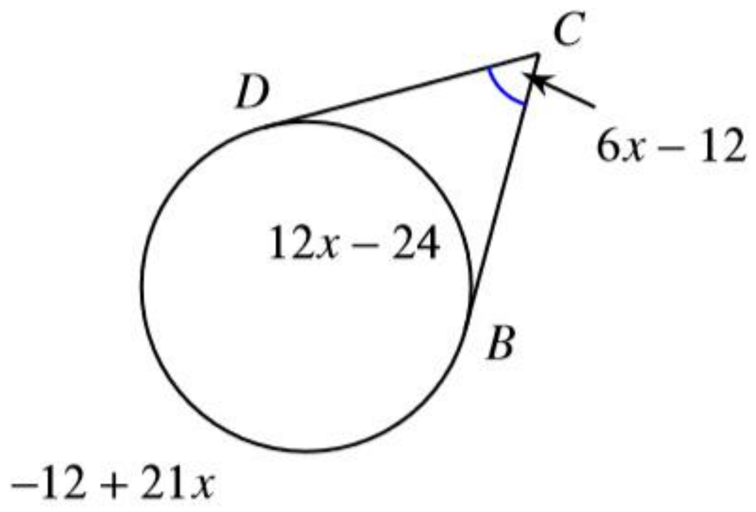
$$5x - 10 = \frac{1}{2}(13x + 7 - 60)$$

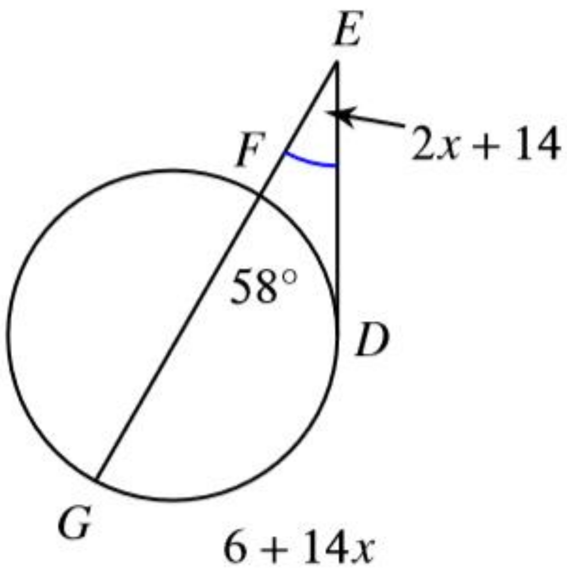
$$10x - 20 = 13x - 53$$

$$33 = 3x$$

$$11 = x$$

Scooby Doo? No you do!





$$6x - 12 = \frac{1}{2}(-12 + 21x - (12x - 24))$$

$$6x - 12 = \frac{1}{2}(-12 + 21x - 12x + 24)$$

$$6x - 12 = \frac{1}{2}(9x + 12)$$

$$12x - 24 = 9x + 12$$
$$3x = 36$$
$$x = 12$$

$$6x + 14 = \frac{1}{2}(6 + 14x - 58)$$

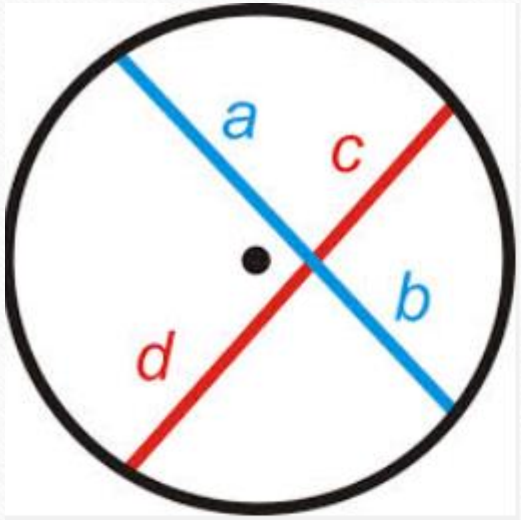
$$6x + 14 = \frac{1}{2}(14x - 52)$$

$$12x + 28 = 14x - 52$$

$$80 = 2x$$

$$40 = x$$

Enough about angles, lets talk chord and segment lengths.



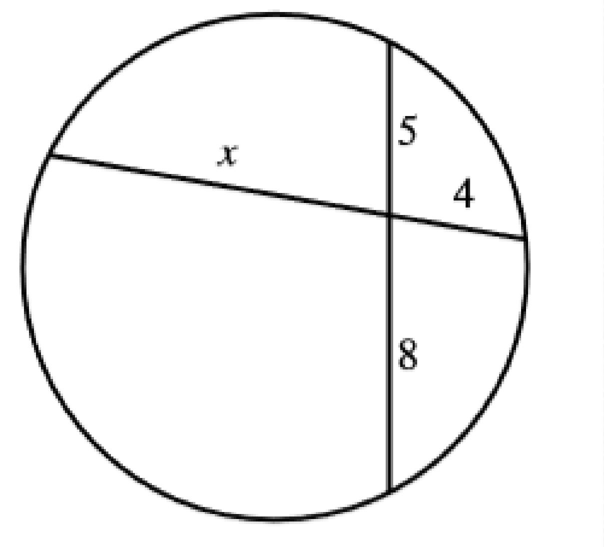
Intersecting Chords

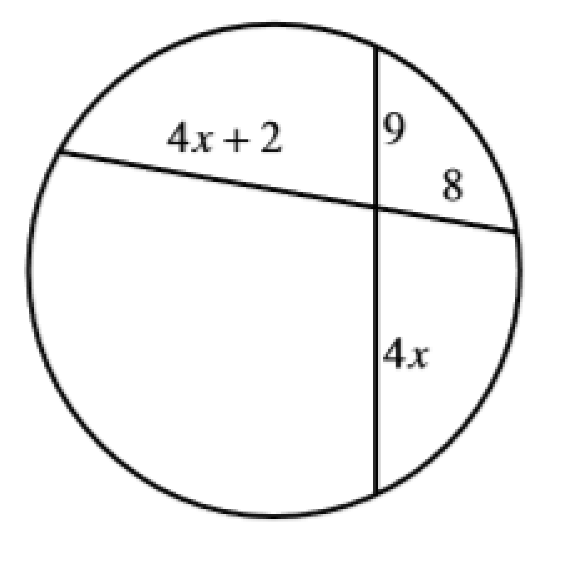
There is a relationship between the segments created when chords intersect within a circle.

(**Segment Piece**)(**Segment Piece**)=(**Segment Piece**)(**Segment Piece**)

ab=**dc**

(**Segment Piece**)(**Segment Piece**)=(**Segment Piece**)(**Segment Piece**)





$$(5)(8) = 4x$$

$$40 = 4x$$

$$10 = x$$

$$(9)(4x) = (8)(4x + 2)$$

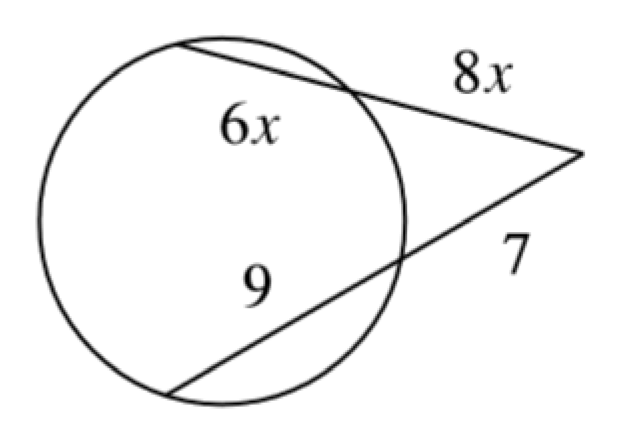
$$36x = 32x + 16$$

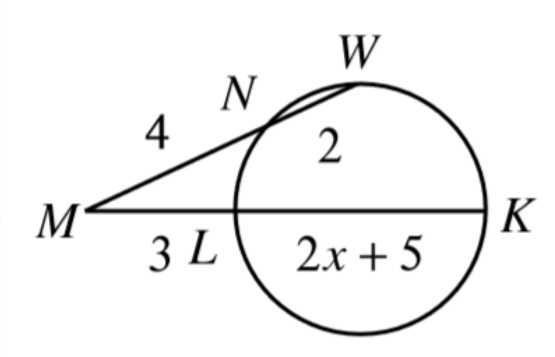
$$4x = 16$$

$$x = 4$$

Secant-Secant Rule

(Whole Secant)(External Part)=(Whole Secant)(External Part)





$$(16)(7) = (6x + 8x)(8x)$$

$$112 = 112x$$

$$x = 1$$

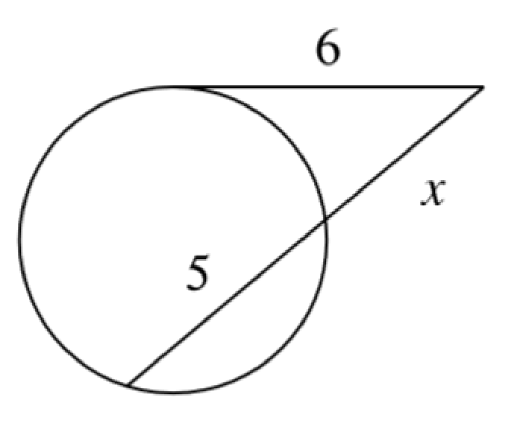
$$(6)(4) = (2x + 5 + 3)(3)$$

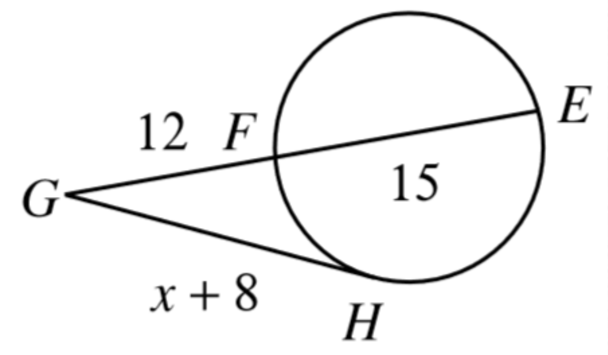
$$24 = 6x + 24$$

$$x = 0$$

Secant-Tangent Rule

(**Whole Secant**)(**External Part**)=(**Tangent**)^2





$$(5 + x)x = 6^2$$
$$5x + x^2 = 36$$
$$x^2 + 5x - 36 = 0$$
$$(x - 4)(x + 8) = 0$$
$$x = 4, \cancel{x = -8}$$

$$(27)(12) = (x + 8)^2$$
$$324 = (x + 8)^2$$
$$18 = x + 8$$
$$10 = x$$

Practice you nuts and bolts. ☺

Intentional typo!

Finish your circles packet and the new handout.