Goals For Today

- Identify Segments/Lines in/on a Circle

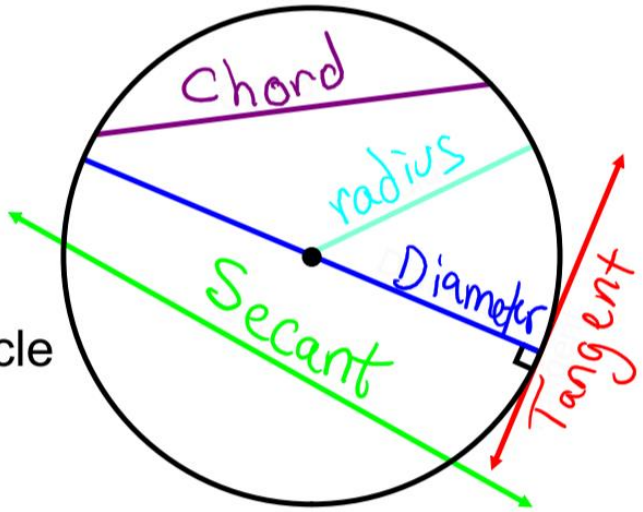
- Learn properties about angles formed from segments/lines in/on a circle.

Refresh of some definitions from last week

Chord - A line that links two points on a circle

Secant - A line that intersects a circle at two points

Tangent - A line that contacts a circle at only one point. Perpendicular to radius.



Let's look at how these lines and segments can intersect to form angles and arcs.

On the Circle

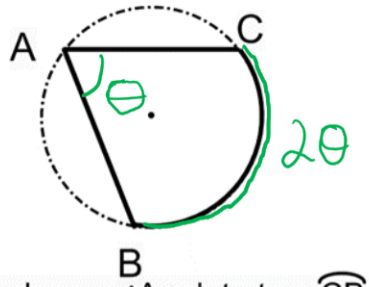
Inscribed Angles

Chord - Tangent

Inscribed Quadrilaterals

Circle Properties

On the Circle
Inscribed Angles

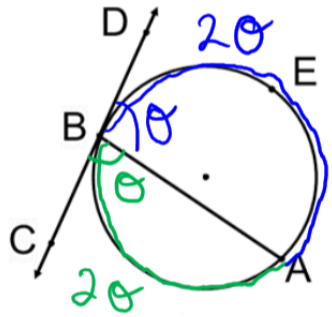


How does $m\angle A$ relate to $m\overset{\frown}{CB}$?

2 · angle = arc

Circle Properties

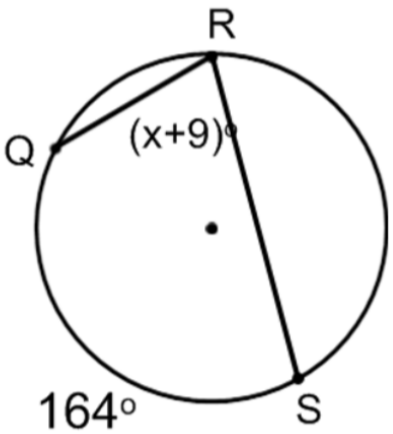
On the Circle
Chord - Tangent



How does $m\angle ABC$ relate to $m\overset{\frown}{AB}$
and $m\angle ABD$ relate to $m\overset{\frown}{BEA}$?

2 · angle = arc

Ex.1: Solve for x



2 (angle) = arc

$2(x+9) = 164$

$2x + 18 = 164$

$2x = 146$

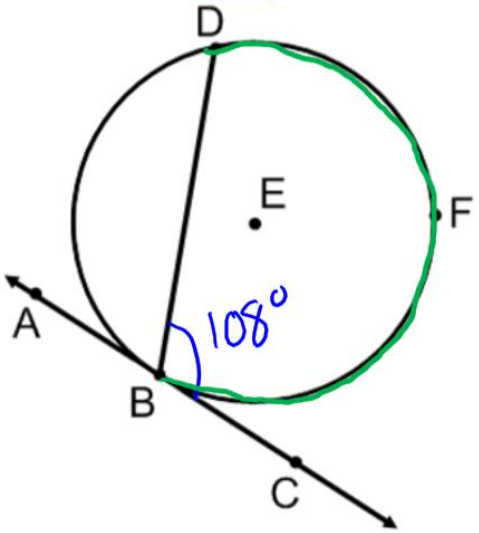
$x = 73$

Ex.2: If $m\angle DBC = 108^o$, what is $m\overset{\frown}{BFD}$?

2(angle) = arc

$2(108) = m\overset{\frown}{BFD}$

$m\overset{\frown}{BFD} = 216^\circ$

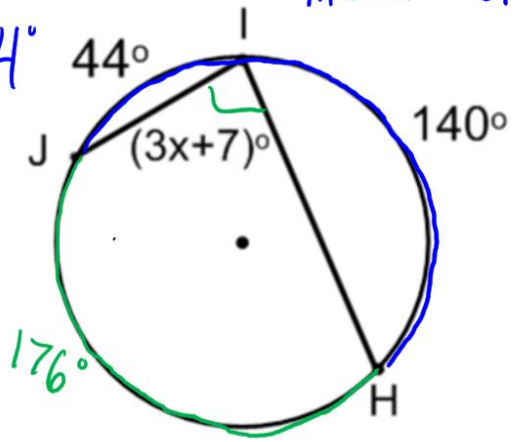


Ex.3: Find the value of x.

$m\overset{\frown}{JIH} = 184^\circ$

$m\overset{\frown}{JH} = 360^\circ - 184^\circ$

$m\overset{\frown}{JH} = 176^\circ$



$\frac{2(3x+7)}{2} = \frac{176}{2}$

$3x+7 = 88$

$3x = 81$

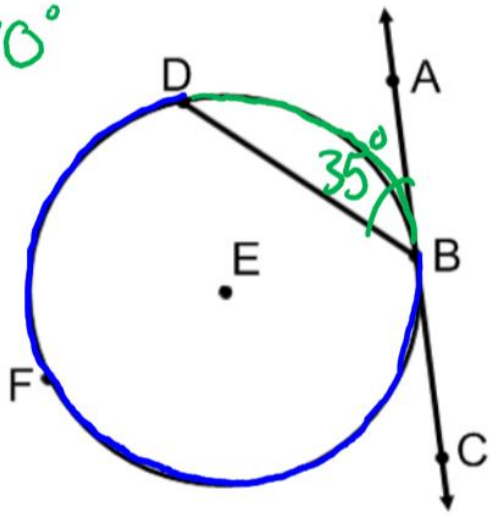
$x = 27$

Ex.4: If $m\angle DBA = 35^o$, what is $m\overset{\frown}{BFD}$?

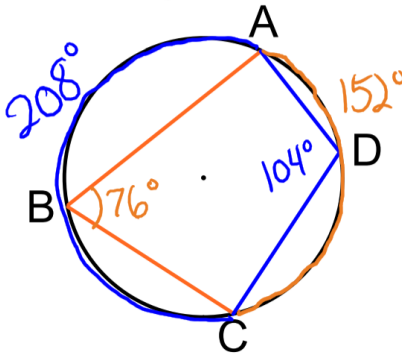
$m\overset{\frown}{DB} = 2(35) = 70^\circ$

$m\overset{\frown}{BFD} = 360 - 70^\circ$

$m\overset{\frown}{BFD} = 310^\circ$



What if you made two connected inscribed angles? What type of shape is made?



If $m\angle B = 76°$ what is the $m\overset{\frown}{AC}$?

$m\overset{\frown}{AC} = 2(76) = 152°$

What would the $m\overset{\frown}{ABC}$ be?

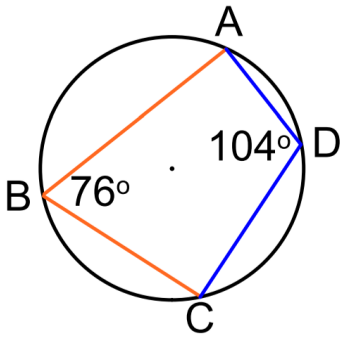
$m\overset{\frown}{ABC} = 360 - 152° = 208°$

What would the $m\angle D$ be?

$2(m\angle D) = m\overset{\frown}{ABC}$

$2(m\angle D) = 208°$

$m\angle D = 104°$



What would $m\angle B + m\angle D$ be?

$76 + 104 = 180°$

Would the same be true for $m\angle A + m\angle C$? Yes because the sum of the interior ∠'s of a quad is 360°.

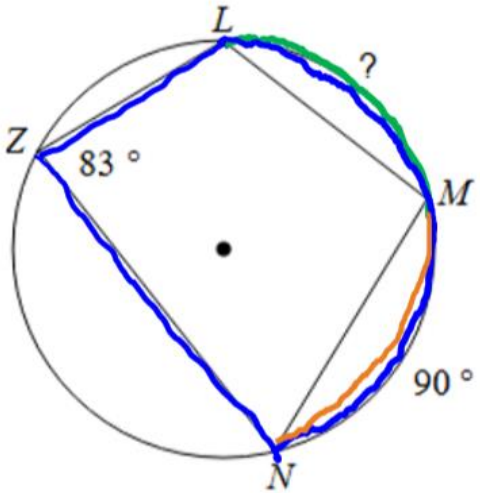
What does this show? Opp. angles in an inscribed quadrilateral are supplementary.

Ex.2: Solve for the value of '?'

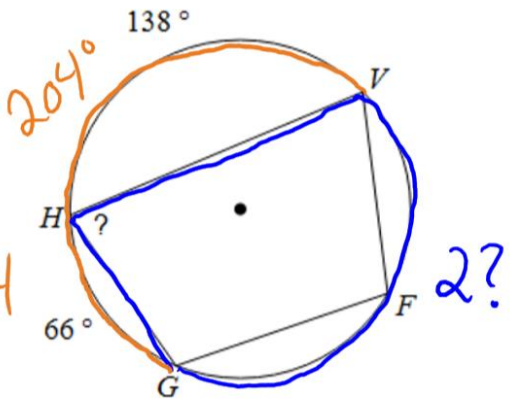
$m\overset{\frown}{LMN} = 166°$

$m\overset{\frown}{LM} = 166 - 90$

$m\overset{\frown}{LM} = 76°$



Ex.3: Solve for the value of '?'



$m\overset{\frown}{VHG} = 138 + 66$

$m\overset{\frown}{VHG} = 204°$

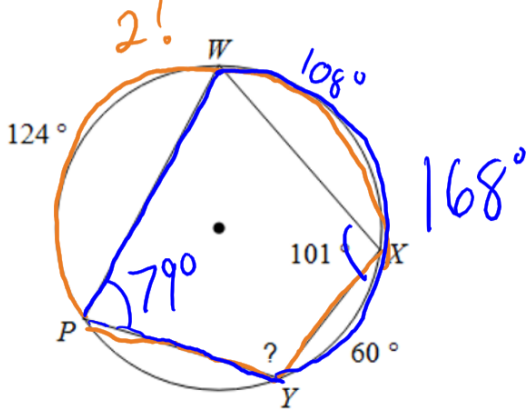
$m\overset{\frown}{VG} = 360 - 204$

$m\overset{\frown}{VG} = 156°$

$2? = 156$

$? = 78°$

Ex.4: Solve for the value of '?'



$\angle P = 180 - 101$

$\angle P = 79°$

$m\overset{\frown}{WY} = 2(m\angle P)$

$m\overset{\frown}{WY} = 2(79)$

$m\overset{\frown}{WY} = 168°$

$m\overset{\frown}{WX} = 168 - 60 = 108°$

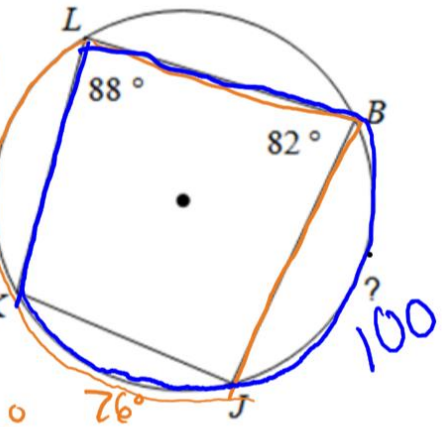
$m\overset{\frown}{PWX} = 124 + 108 = 232°$

$2? = m\overset{\frown}{PWX}$

$2? = 232$

$? = 116°$

Review



$m\overset{\frown}{LKJ} = 2(82)$

$= 164°$

$m\overset{\frown}{KJ} = 164 - 88 = 76°$

$m\overset{\frown}{BJK} = 88 \cdot 2 = 176°$

$m\overset{\frown}{BJ} = 176 - 76$

$m\overset{\frown}{BJ} = 100°$

$? = 100°$