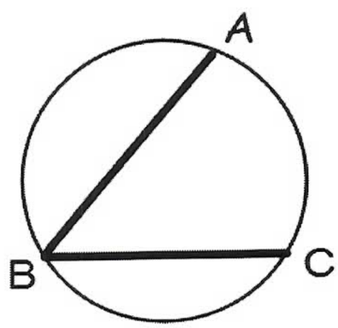
Math III
Unit 5: Circles
Day 5 - Inscribed Angles

Name: ______________________

Date: ______________ Period: _____

inscribed angle - an angle formed by 2 chords that intersect at a **point on the circle**

intercepted arc - the arc that lies in the interior of the angle

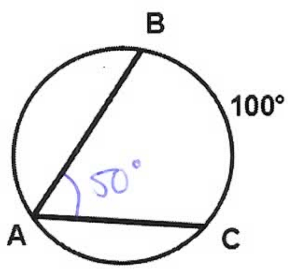


∡ABC is an inscribed angle

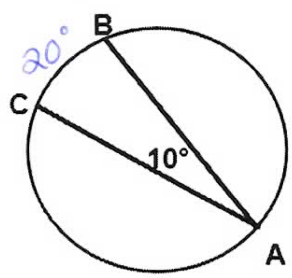
$\widehat{AC}$ is the intercepted arc

Theorem - If an angle is inscribed in a circle, then its measure is half the measure of its intercepted arc.

Example #1: Find the m∡BAC



Example #2: Find $m\widehat{BC}$.



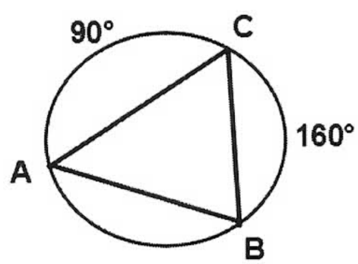
Example #3:

m∡A = 80° } 125°

m∡B = 45°

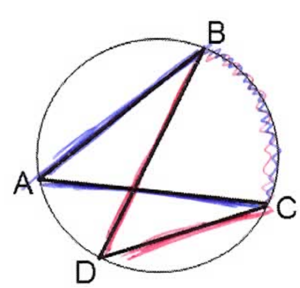
m∡C = 180-125 = 55°

$m\widehat{AB}$ = 110°



Theorem - If two inscribed angles of a circle intercept the same arc, then the angles are congruent.

∠BAC ≅ BDC



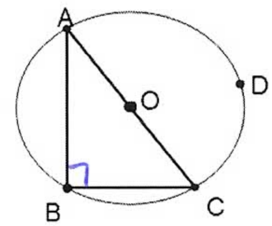
Math III **Name:** ______________________________

Unit 5: Circles

Day 5 - Inscribed Angles **Date:** ____________________ **Period:** _____

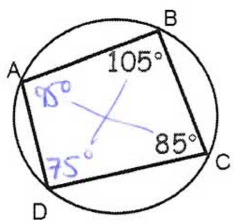
Theorem - An angle that is inscribed in a circle is a right angle if and only if its corresponding arc is a semicircle.

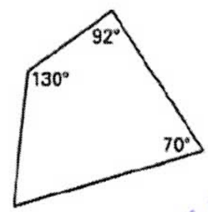
$\angle ABC = 90°$



Theorem - A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.

add to 180°





not inscribed in a circle because $130+70 \neq 180$

Example #4: Use the figure at the right to find each angle or arc measure.

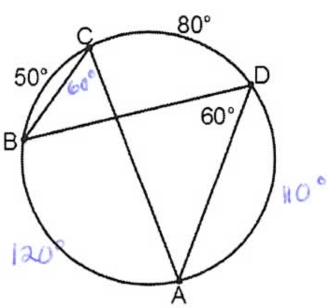
m∡A = 40°

m∡B = 40°

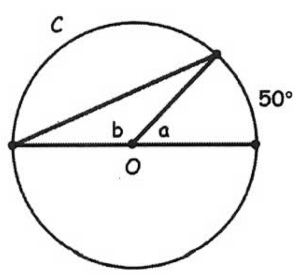
m∡C = 60°

$m\widehat{AB}$ = 120°

$m\widehat{AD}$ = 110°



Find the a, b and c.



$a = 50°$

$c = 130°$

$b = 130°$

*central angles are the same as their intercepted arcs.

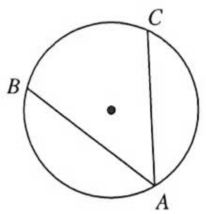
Name________________________________

Inscribed Angles

Date________________ Period____

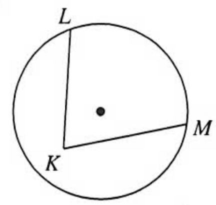
State if each angle is an inscribed angle. If it is, name the angle and the intercepted arc.

1)



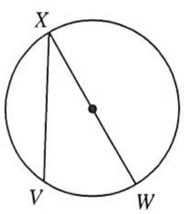
yes; $\angle BAC$, $\overset{\frown}{BC}$

2)



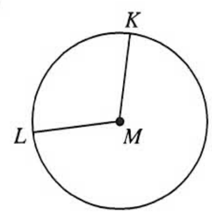
no

3)



yes; $\angle VXW$, $\overset{\frown}{VW}$

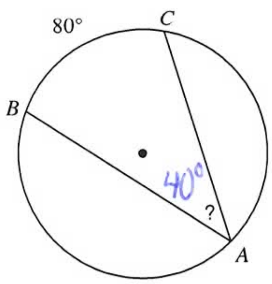
4)



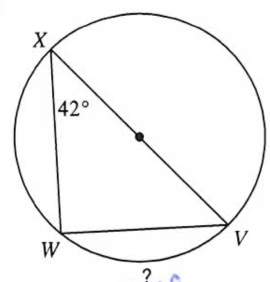
no

Find the measure of the arc or angle indicated.

5)

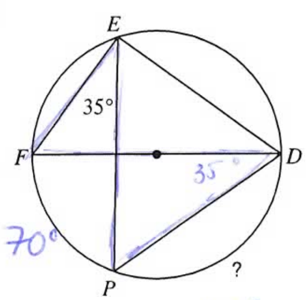


6)



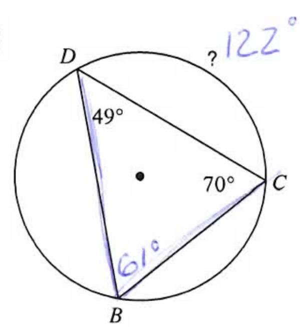
84°

7)



110°

8)



Geometry | **Name:** ______________________________
Guided Notes
Circumference and Arc Lengths of Circles | **Date:** ____________________ **Period:** ____

circumference - the distance around the circle.

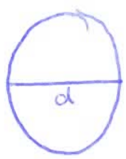
For all circles, the ratio of the circumference to the diameter is the same. The ratio is known as pi (π).

Circumference of a Circle - The circumference, C, of a circle is **C = πd or C = 2πr**, where **d is the diameter** of the circle and **r is the radius** of the circle.

Example #1: Find the circumference of a circle with a **radius** of **10** cm.

$C = 2\pi(10)$
$= 20\pi$

Example #2: Find the **diameter** of a circle that has a **circumference of 24** m.



$C = 24$

$\frac{24}{2\pi} = \frac{2\pi r}{2\pi}$

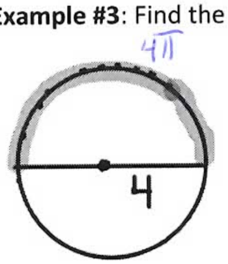
$\frac{12}{\pi} = r \rightarrow d = \frac{24}{\pi}$

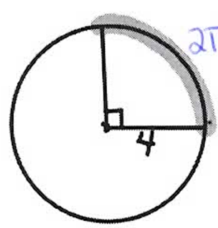
arc length - a **portion** of the **circumference** of a circle

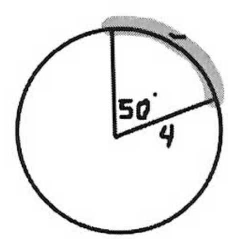
$m\widehat{ARC}$ **represents the measure of the arc in degrees**

$\widehat{ARC}$ **represents the length of the arc in linear units**

Example #3: Find the length of each arc.







$\frac{1}{2} \cdot 2\pi(4) = 4\pi$

$\frac{1}{4} \cdot 2\pi(4) = 2\pi$

$\frac{50}{360} \cdot 2\pi(4) = \frac{10\pi}{9}$

Arc Length Corollary: In a circle, the ratio of the length of a given arc to the circumference is equal to the ratio of the measure of the arc to 360°.

$$\frac{\textbf{Arc Length}}{\mathbf{2\pi r}} = \frac{\textbf{Arc measure (in degrees)}}{\mathbf{360°}}$$

easier! $\frac{\text{degrees}}{360} \cdot 2\pi r = \text{arc length}$

(portion of the circle) · (circumference) = arc length (portion of the circumference)

Geometry
Guided Notes
Circumference and Arc Lengths of Circles

Name: ______________________________

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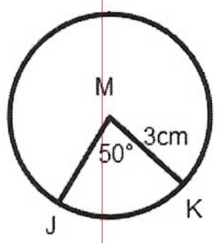
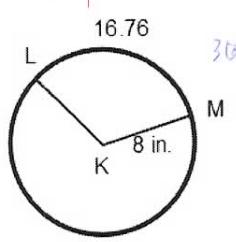
Example #4: Find the length of $\widehat{JK}$



$\frac{50}{360}\cdot 2\pi(3) = \frac{5\pi}{6}$ cm

Example #5: Find $m\widehat{LM}$

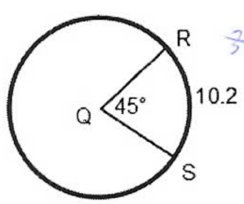


$\cancel{360}\cdot\frac{x}{\cancel{360}}\cdot 2\pi(8) = 16.76\cdot 360$

$\frac{x\cdot \cancel{16\pi}}{(\cancel{16\pi})} = \frac{6033.6}{(16\pi)}$

$x = 120°$

Example #6: Find the circumference of **ʘQ.**

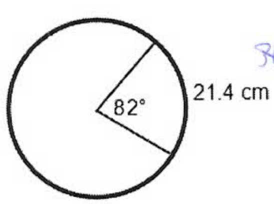


$\cancel{360}\cdot\frac{45}{\cancel{360}}\cdot 2\pi r = 10.2\cdot 360$

$\frac{\cancel{45}\cdot 2\pi r}{\cancel{45}} = \frac{3672}{45}$

$2\pi r = 81.6$
(C)

Example #7: Find the radius of the circle.

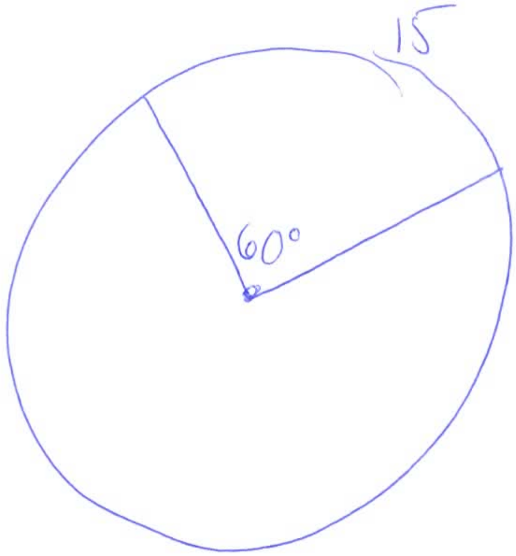


$\cancel{360}\cdot\frac{82}{\cancel{360}}\cdot 2\pi r = 21.4\cdot 360$

$\frac{82\cdot 2\pi r}{(82\cdot 2\pi} = \frac{7704}{(82\cdot 2\pi)}$

$r = 14.95$ cm

1.



Find the radius.

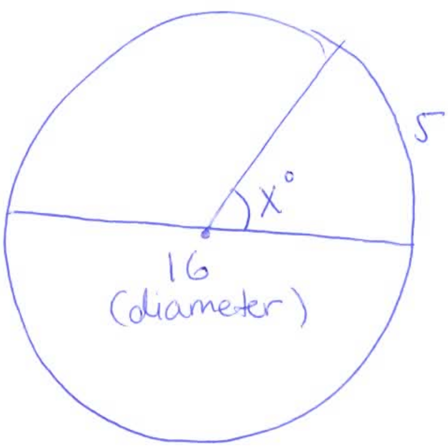
$$\cancel{360}\,\frac{60}{\cancel{360}} \cdot 2\pi r = 15 \cdot 360$$

$$\frac{60 \cdot 2\pi r}{60} = \frac{5400}{60}$$

$$\frac{2\pi r}{2\pi} = \frac{90}{2\pi}$$

$$r = 14.32$$

2.



$$\cancel{360}\,\frac{x}{\cancel{360}} \cdot 2\pi(8) = 5 \cdot 360$$

$$\frac{x \cdot 16\cancel{\pi}}{16\pi} = \frac{1800}{16\pi}$$

$$x = 35.81^\circ$$