Geometry Name_____

HW ~~12~~ 13 Period_____ Date_____

Determine the Center and Radius of the given circles.

1. $(x-5)^2 + (y+8)^2 = 16$ Center (5, -8) Radius = 4

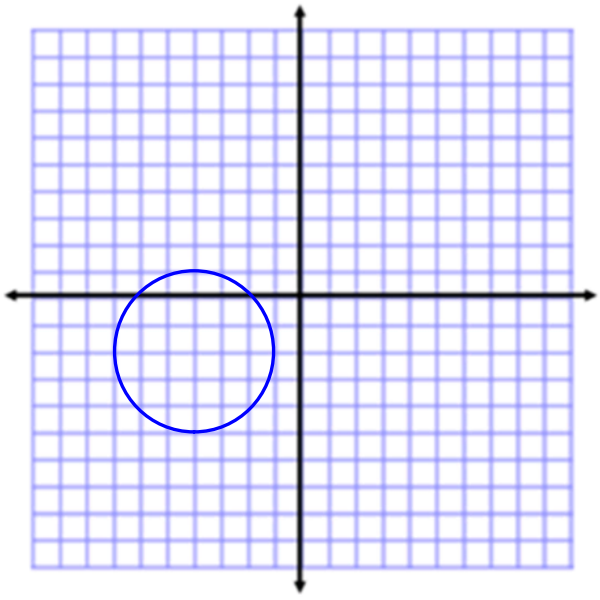
2. $25 = x^2 + (y-7)^2$ Center (0, 7) Radius = 5

Determine the equation of circle C.

3. Radius = 8cm, C(2,-6) $(x-2)^2 + (y+6)^2 = 64$

4. 7. Radius = $\sqrt{7}$ cm, C(-3, -1) $(x+3)^2 + (y+1)^2 = 7$

5. Graph the following circle. $(x+4)^2 + (y+2)^2 = 9$



Write the standard form of a circle based on the given information.

6. Center: (2, -5), Point on Circle: (-7, -1)

$(x-2)^2 + (y+5)^2 = 97$

7. Endpoints of diameter: (-3, 11) and (3, -13)

$x^2 + (y+1)^2 = 153$

8. Put each circle in general form. $(x-7)^2 + (y+10)^2 = 81$

$x^2 + y^2 - 14x + 20y + 58 = 0$

Determine the Center and Radius of the given circles by completing the square.

9. $x^2 + y^2 + 14x - 12y + 4 = 0$ Center (-7, 6) Radius = 9

10. $x^2 + 2x + y^2 = 55 + 10y$ Center (-1, 5) Radius = 9

Class Notes 4: Sector Area and Arc Length

Warm Up: Name or find the following:

Center: P

r=3 Radius: $\overline{PA}$, $\overline{PB}$, $\overline{PC}$

↕ 2r=d

d=6 Diameter: $\overline{AB}$

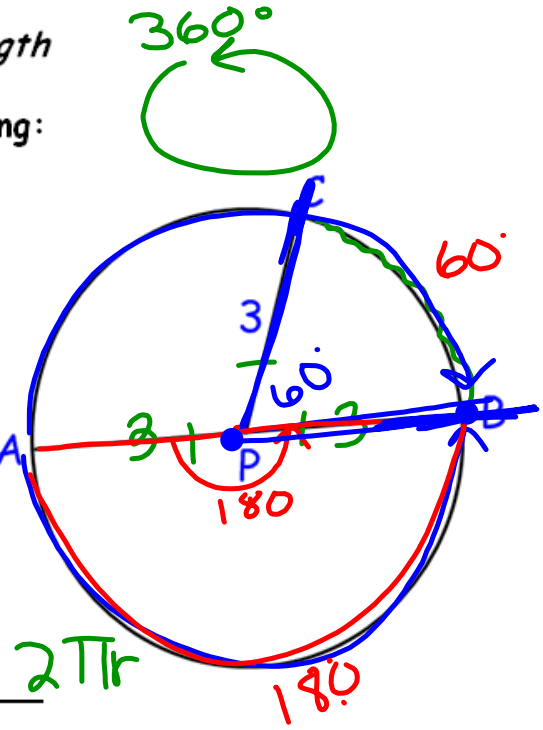
Arc: $\overset{\frown}{CB}$, $\overset{\frown}{AC}$, $\overset{\frown}{AB}$, $\overset{\frown}{ACB}$

Central Angle: ∠APC, ∠BPC

↳ = int. arc

Area (formula): πr^2

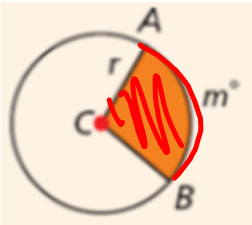
Circumference (formula): πd or $2\pi r$



→ vertex @ the center

A sector of a circle is a region bounded by two radii of the circle and their intercepted arc.

Sector ACB is illustrated to the right.



The area of a sector is a fraction of the circle's area.

We can write and solve the following proportion to find the area of a sector.

$$\frac{A}{\pi r^2} = \frac{m}{360}$$

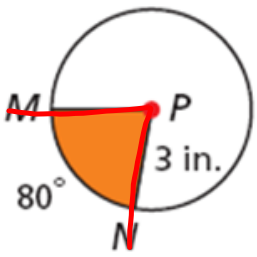
HELPFUL HINT: Write the degree symbol after *m* in the formula to help you remember to use degree measure NOT arc length.

$$\frac{A}{\pi r^2} = \frac{m^\circ}{360^\circ}$$

Finding the Area of a Sector

Find the area of each sector. Give your answer in terms of π rounded to the nearest hundredth.

A sector *MPN*



$$\frac{A}{\pi r^2} = \frac{m^\circ}{360^\circ}$$

$$\frac{A}{\pi(3)^2} = \frac{80^\circ}{360^\circ}$$

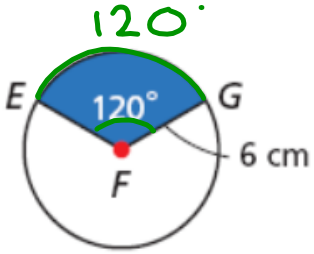
$$\frac{360A}{360} = \frac{720\pi}{360}$$

$$A = 2\pi \text{ in}^2$$

$$\approx 6.283185\ldots$$

$$\approx 6.28 \text{ in}^2$$

B sector *EFG*



$$\frac{A}{\pi r^2} = \frac{m}{360}$$

$$\frac{A}{\pi(6)^2} = \frac{120}{360}$$

$$\frac{360}{360}A = \frac{4320\pi}{360}$$

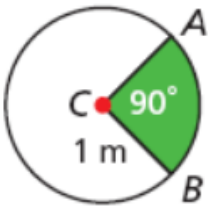
$$A = 12\pi \text{ cm}^2$$

$$A \approx 37.70 \text{ cm}^2$$

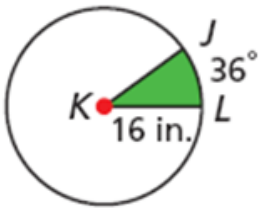
TRY IT!

Find the area of each sector. Give your answer in terms of π and rounded to the nearest hundredth.

1) sector ACB

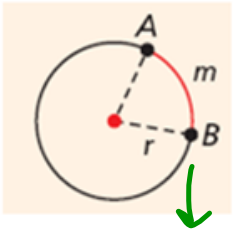


2) sector JKL



An arc length of a circle is the distance along an arc measured in linear units (not degrees).

ft
in
cm



The arc length is a fraction of the circle's circumference.

We can write and solve the following proportion to find the arc length.

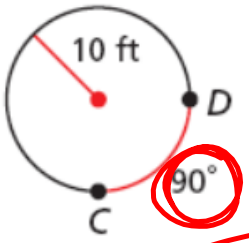
$$\frac{L}{2\pi r} = \frac{m}{360}$$

Finding Arc Length

$\frac{L}{2\pi r} = \frac{m}{360}$

Find each arc length. Give your answer in terms of π and rounded to the nearest hundredth.

A $\overset{\frown}{CD}$



$\frac{L}{2\pi r} = \frac{m}{360}$

$\frac{L}{2\pi(10)} = \frac{90}{360}$

$360L = 1800\pi$

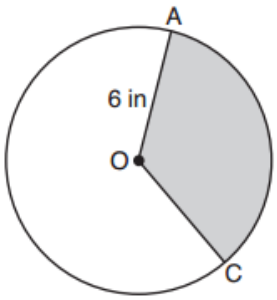
$\frac{360}{360}$

$L = 5\pi$ ft

15.71 ft

B an arc with measure 35° in a circle with radius 3 in.

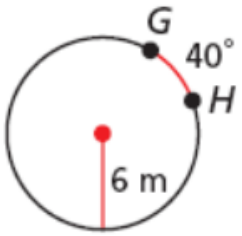
29 In the diagram below of circle O, the area of the shaded sector AOC is 12π in^2 and the length of $\overline{OA}$ is 6 inches. Determine and state $m\angle AOC$.



TRY IT!

Find each arc length. Give your answer in terms of π and rounded to the nearest hundredth.

1) $\overset{\frown}{GH}$



2) An arc length with measure 135 degrees in a circle with radius 4 cm.

What is the difference between arc measure and arc length?

Write the formula for the Area of a Sector

Write the formula for the Length of an Arc