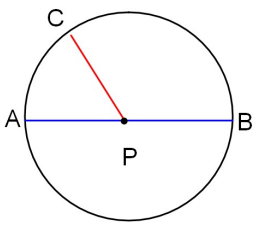
Sec 10-6: Circles and Arcs.

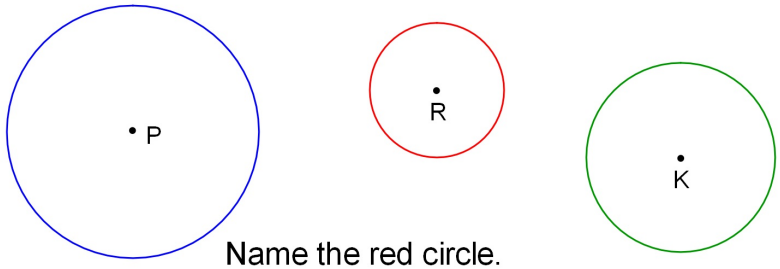


Circle: Set of all points in a plane equidistant from a given point (Center)

Radius: Segment connecting the center of a circle to any point on the circle.

Diameter: Segment connecting 2 points on a circle that passes through the center.

Central Angle: Angle whose vertex is the center of a circle.



Name the red circle.

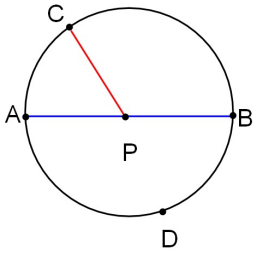
Circle R ⊙R

To name a circle you use the center.

Arc: Part of a circle.

To name an arc: Use two or three letter where first and last are the endpoints and the third is a point inbetween.

Symbol: $\overset{\frown}{QR}$ "arc QR"



Semicircle = half of a circle.

Must use 3 letters

ex: $\overset{\frown}{ADB}$

Minor Arc < a semicircle.

2 letters

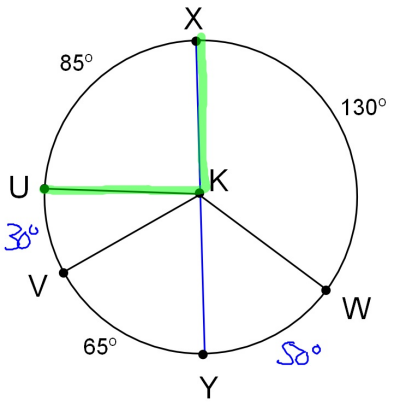
ex: $\overset{\frown}{AC}$

Major Arc > semicircle

Must use 3 letters

ex: $\overset{\frown}{CBA}$

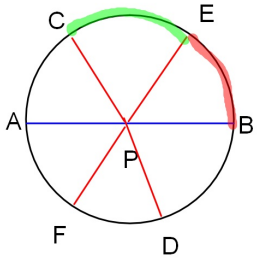
Use circle K with diameter XY to find the measure of each Central Angle.



1. $\angle XKU$ 85°
2. $\angle YKW$ 50°
3. $\angle XKV$ 115°
4. $\angle UKW$ 145°
5. $\angle XKY$ 180°

Adjacent Arcs: Arcs of the same circle that have exactly one point in common.

They do not overlap and there is no gap between them



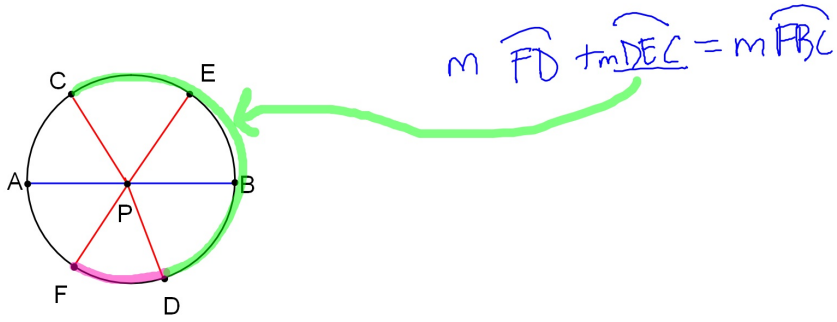
Highlight two adjacent arcs

Name two adjacent arcs.

ex: $\overset{\frown}{FD}$ and $\overset{\frown}{DB}$

Arc Addition Postulate: The sum of two adjacent arcs

$$m\overset{\frown}{AC} + m\overset{\frown}{CE} = m\overset{\frown}{AE}$$



Circumference of a Circle:

The distance around the outside of a circle.

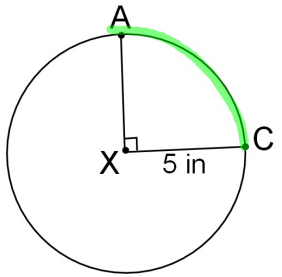
$C = 2\pi r$ or πd

Arc Length: A part of the circles circumference.
Given in units such as in., cm., ft., ...

How is arc length different from the measure of an arc?

Arc length is given in linear units (cm, in, ft...) and the measure of an arc is given in degrees.

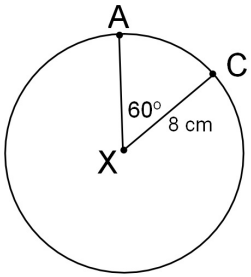
Find the length of $\overset{\frown}{AC}$ to the nearest tenth.



$C =$

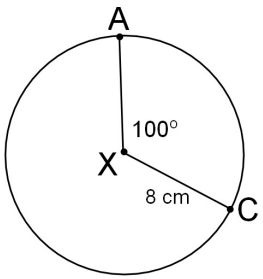
$C = 2\pi(5) = 10\pi = 7.9$

Find the length of $\overset{\frown}{AC}$ to the nearest tenth.



$C = 2\pi(8) = \frac{16\pi}{6} = 8.4$ cm

Find the length of $\overset{\frown}{AC}$ to the nearest tenth.



Arc Length:

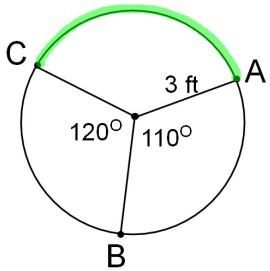
$$\frac{\text{Part of a circle}}{\text{Whole circle}} = \frac{\text{Part of a circle}}{\text{Whole circle}}$$

$$\frac{\text{Length of an arc}}{\text{Circumference}} = \frac{\text{Measure of the central angle}}{360^\circ}$$

$X = 14.0$ cm

$\frac{x}{2\pi(8)} = \frac{100}{360}$

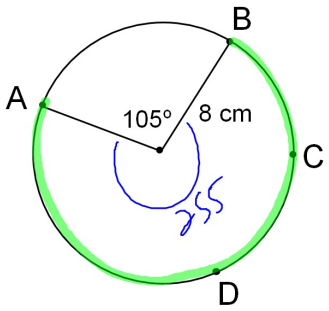
Find the length of $\overset{\frown}{AC}$ to the nearest tenth.



$\frac{X}{2\pi(3)} = \frac{130^\circ}{360^\circ}$

$X = 6.8$ ft

Find the length of $\overset{\frown}{ADB}$ to the nearest tenth.



$\frac{X}{16\pi} = \frac{255}{360}$

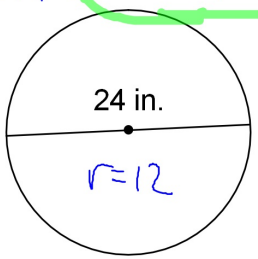
$X = 35.6$ cm

Find the area of each circle.

$A = \pi r^2$

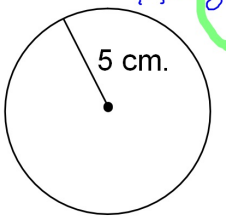
1. Round to the nearest tenth.

$144\pi \approx 452.4$ in^2



2. Give answer in terms of π.

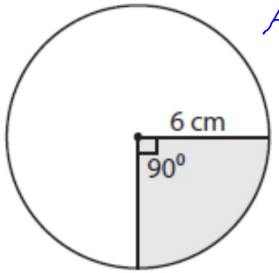
$A = 25\pi$ cm^2



Area of a sector: Part of a circles area.

Find the area of the shaded sector to the nearest tenth.

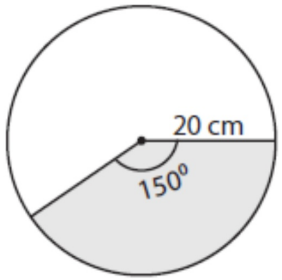
$A = \pi(6)^2 = 36\pi$



28.3 cm^2

$\frac{90}{360} = \frac{X}{36\pi}$

Find the area of the shaded sector to the nearest tenth.



$\frac{150}{360} = \frac{X}{\pi(20)^2}$

400π

523.6 cm^2

Area of a sector formula:

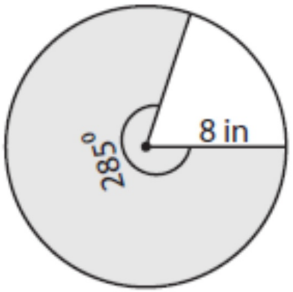
Area of a Sector:

$$\frac{\text{Part of a circle}}{\text{Whole circle}} = \frac{\text{Part of a circle}}{\text{Whole circle}}$$

$$\frac{\text{Area of the Sector}}{\text{Area of the Circle}} = \frac{\text{Measure of the central angle}}{360^\circ}$$

πr^2

Find the area of this sector to the nearest tenth.



$$\frac{x}{64\pi} = \frac{285}{360}$$

$159.2\ in^2$