Grab a blue, yellow and green sheet from the front.

Warm Up:

1. How would you define a circle?

2. What is the formula for circumference and area?

$C = 2\pi r = \pi d$

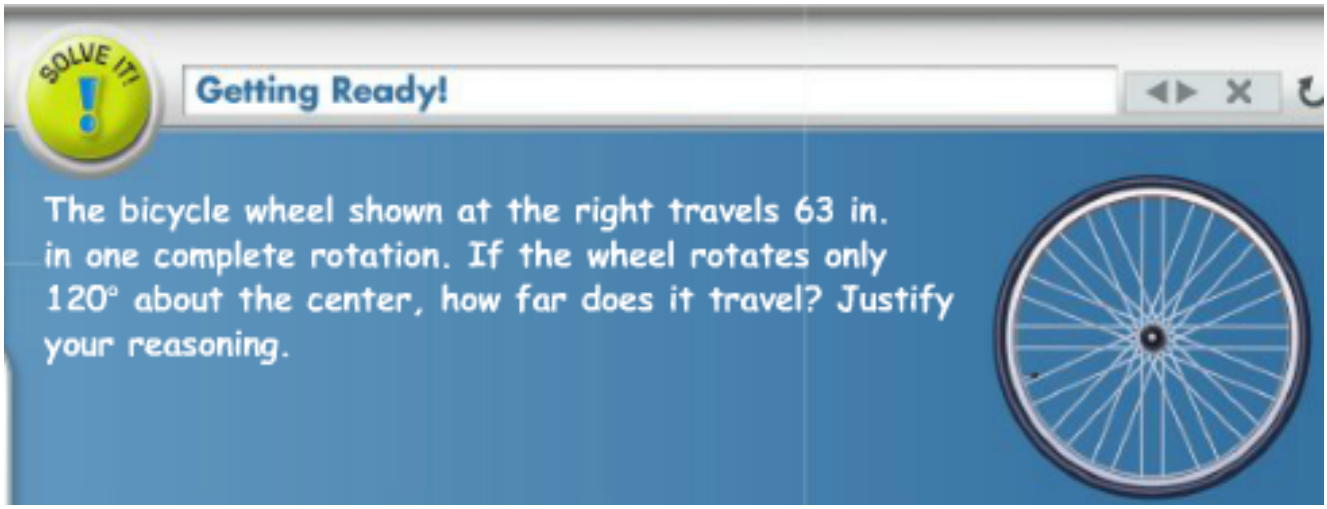
$A = \pi r^2$

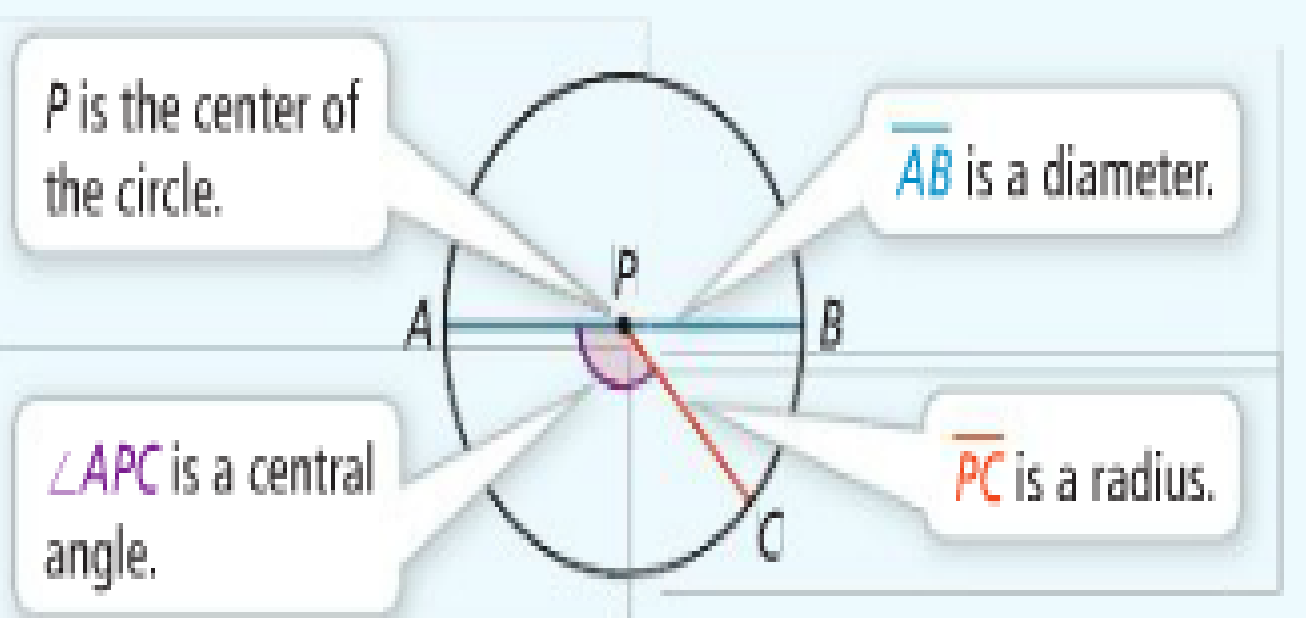
Learning Goal: Today I will learn about arcs.

Success Criteria: I am able to identify major and minor arcs and determine the measure of an arc.

10-6 Circles and Arcs

Why we need to know it:




P is the center of the circle.
$\overline{AB}$ is a diameter.
P
A
B
C
∠APC is a central angle.
$\overline{PC}$ is a radius.

*Circle ys

The set of all **points** equidistant from a given **center.** (h,k)

Congruent circles have the **congruent radii**.

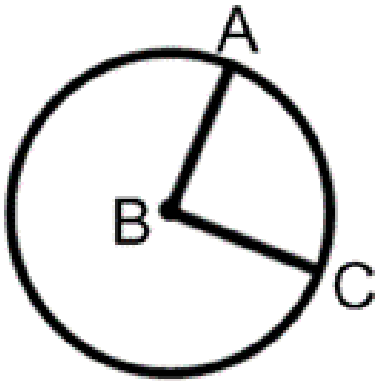
All circles are similar to each other. Why?

*Central Angle

ys

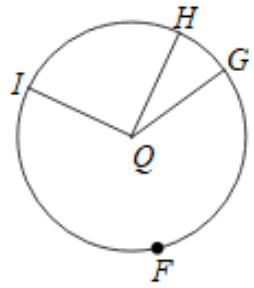
An angle whose **vertex** is at the **center** of the circle.

Angle ABC is a central angle of Circle B.



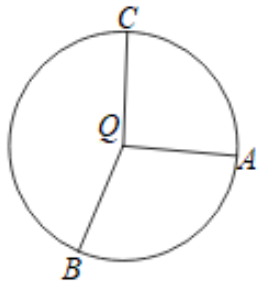
Name the central angle of the given arc.

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



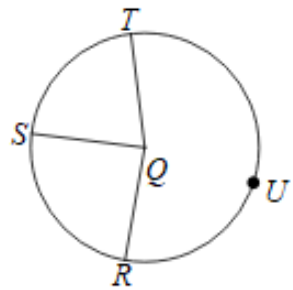
$\angle IQH$

2) $\overset{\frown}{AC}$



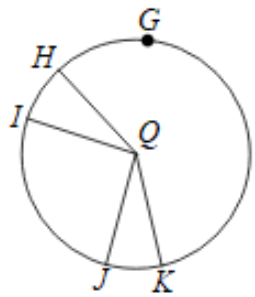
$\angle AQC$

3) $\overset{\frown}{RTS}$



$\angle RQS$

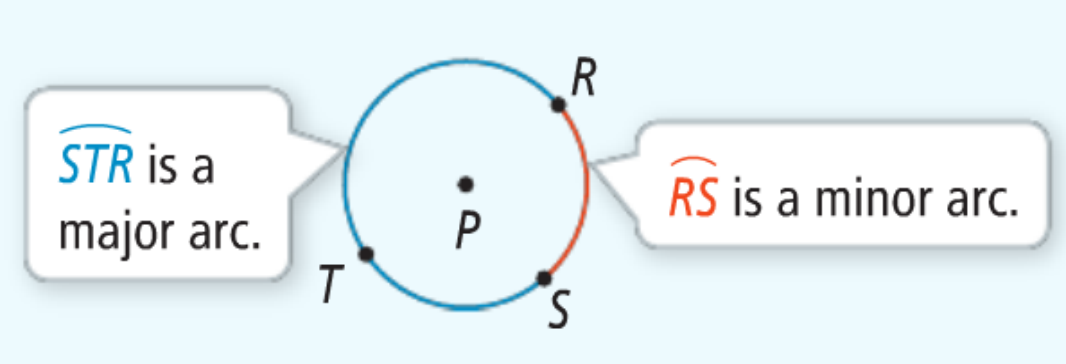
4) $\overset{\frown}{IKH}$



$\angle IQH$

*Arcs

Arc - a piece of the circumference ys



Semi-circle - an **arc** that is **half** of a circle.

Use 3 letters to write arc

Minor arc - **less** than **half** of a circle.

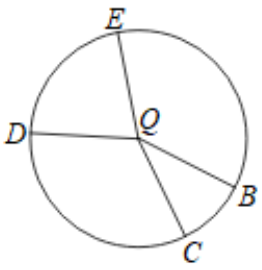
Use 2 letters to write arc

Major arc - **more** than **half** of a circle.

Use 3 letters to write arc

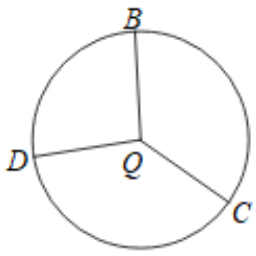
Name the arc made by the given angle.

1) Major arc for $\angle CQD$



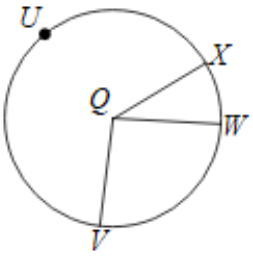
$\overset{\frown}{CED}$

2) $\angle BQC$



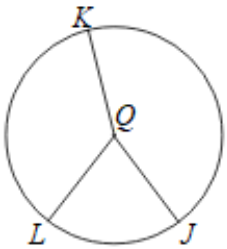
$\overset{\frown}{BC}$

3) $\angle WQV$



$\overset{\frown}{WV}$

4) $\angle LQK$

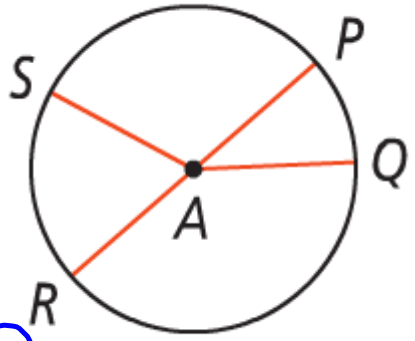


$\overset{\frown}{LK}$

Example

For circle A:

- name all the minor arcs $\overset{\frown}{SR}$ $\overset{\frown}{RQ}$ $\overset{\frown}{PQ}$ $\overset{\frown}{PS}$
- name all the major arcs $\overset{\frown}{SRQ}$ $\overset{\frown}{QPR}$
- name at least 3 central angles $\angle SAR$, $\angle RAQ$, $\angle PAQ$



take note

Key Concept Arc Measure

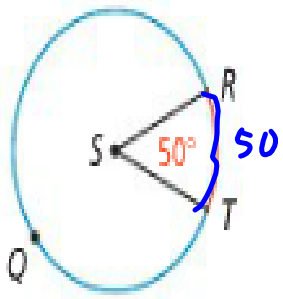
Arc Measure

The measure of a minor arc is equal to the measure of its corresponding central angle.

The measure of a major arc is the measure of the related minor arc subtracted from 360.

The measure of a semicircle is 180.

Example



$m\overset{\frown}{RT} = m\angle RST = 50$

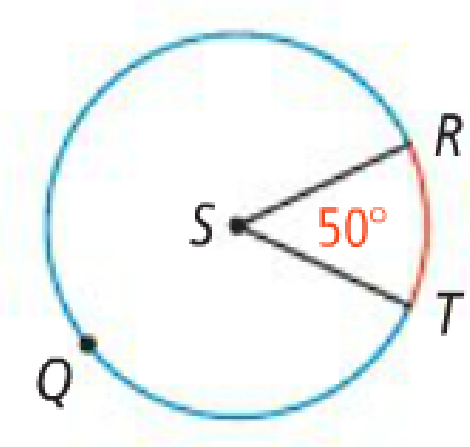
$m\overset{\frown}{TQR} = 360 - m\overset{\frown}{RT}$

$= 310$

Arc Measure

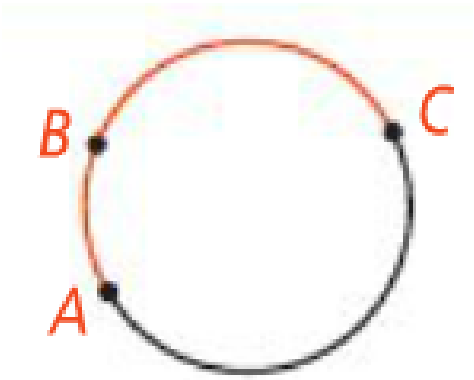
Arc measure is equal to its central angle.

$$m\overset{\frown}{RT} = m\angle RST = 50$$
$$m\overset{\frown}{TQR} = 360 - m\overset{\frown}{RT}$$
$$= 310$$



Postulate 10-2 Arc Addition Postulate

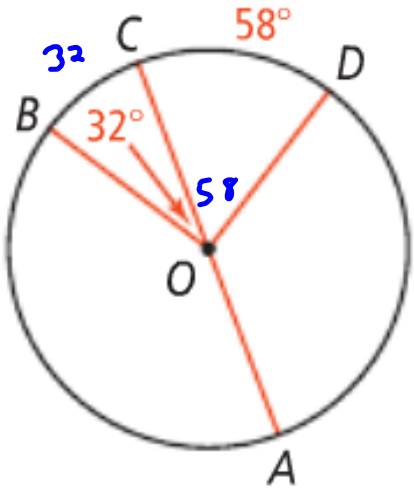
The measure of the arc formed by **two smaller** arcs is the **sum** of the measures of the arcs.



$$m\overset{\frown}{ABC} = m\overset{\frown}{AB} + m\overset{\frown}{BC}$$

Arc Measure

Find the measure of each arc in circle O.



$m\overset{\frown}{BD} = m\overset{\frown}{BC} + m\overset{\frown}{CD}$

$m\overset{\frown}{BC} =$ 32°

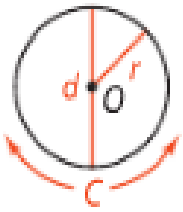
$m\overset{\frown}{AB} =$ 180-32=148° $m\overset{\frown}{ABC} =$ 180°

Take Note

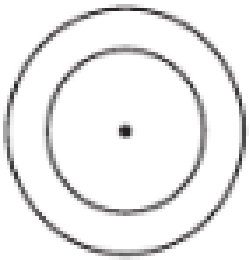
Theorem 10-9 Circumference of a Circle gs

The circumference of a circle is π times the diameter.

$C = \pi d$ or $C = 2\pi r$

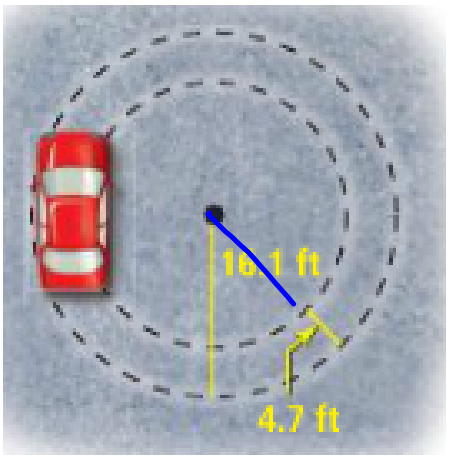


Coplanar circles that have the same center are **concentric circles.** ys



Concentric circles

A car has a circular turning radius of 16.1 ft. The distance between the two front tires is 4.7 ft. How much farther does a tire on the outside of the turn travel than a tire on the inside?



πr^2

$\pi(16.1)^2 = 814$

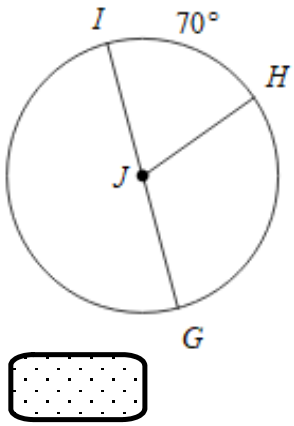
$\pi(11.4)^2 = 408.3$

$C = 2\pi(16.1) = 101.2$

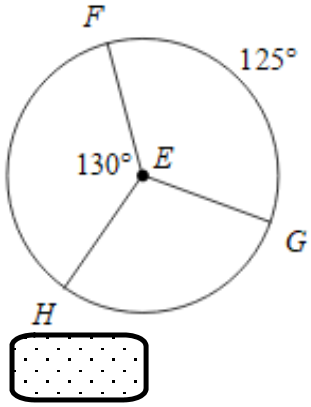
$C = 2\pi(11.4) = 71.6$

Closure: Today I learned about major and minor arcs. I also learned how to find the measure of an arc.

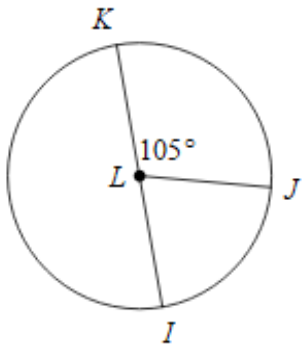
1) $m\angle HJG$



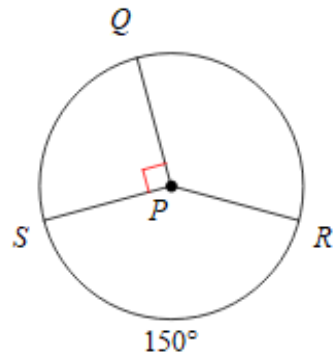
2) $m\angle GEH$



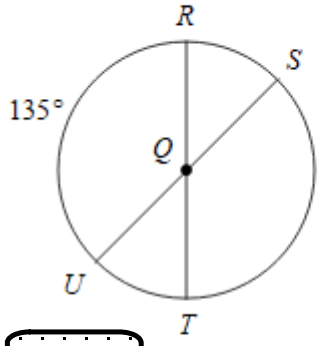
3) $m\angle JLI$



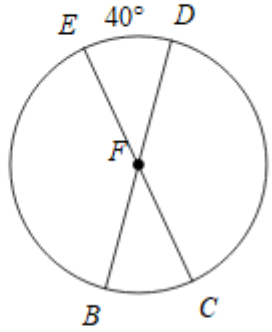
4) $m\angle QPR$



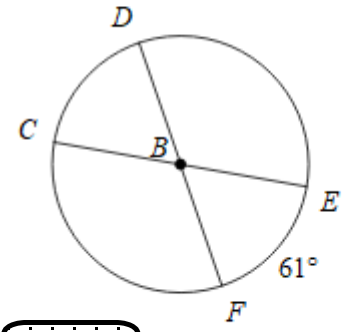
5) $m\angle RQS$



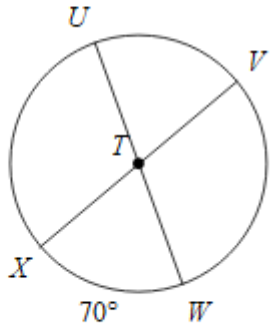
6) $m\angle BFE$



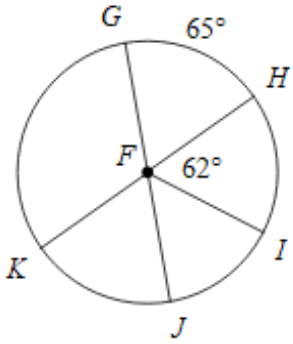
7) $m\angle DBE$



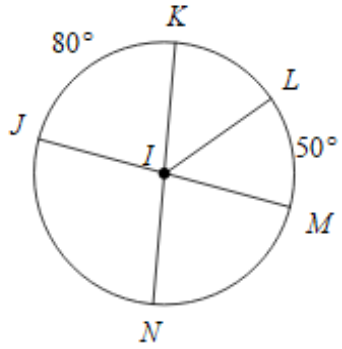
8) $m\angle VTW$



9) $m\angle KFG$

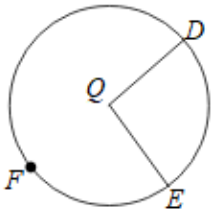


10) $m\angle MIN$

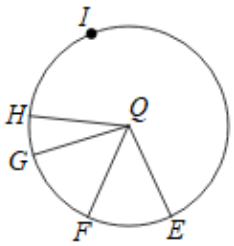


Name the arc made by the given angle.

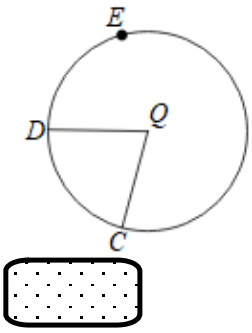
11) $\angle DQE$



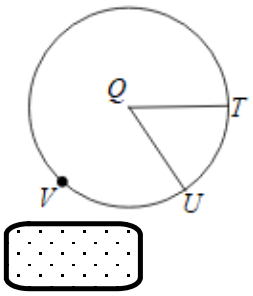
12) $\angle EQH$



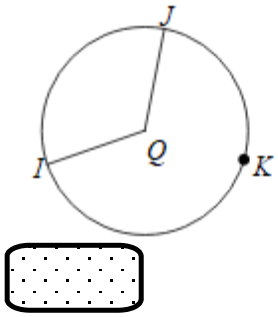
13) $\angle CQD$



14) Major arc for $\angle TQU$



15) Major arc for $\angle IQJ$



16) Major arc for $\angle BQC$