9.0 Circle Definitions and Arcs Day 2

Learning Targets:

a. I can use central angles of a circle to find major and minor arcs of a circle.
b. I can use major and minor arcs of a circle to find central angles of a circle.

Use the link below to make conjectures about the following:

- What is the difference between a major and minor arc?
- How do you name a minor arc? Major arc?
- What relationship does the central angle have with the minor arc? Major arc?

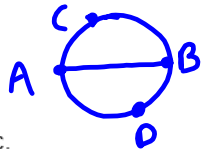
https://www.geogebra.org/m/xr8EQMYs

Any two points *A* and *B* on a circle *C* determine a ***MINOR ARC*** and a ***MAJOR ARC***.

MINOR ARC - The shorter arc connecting two points on a circle.

- A minor arc is less than 180°.
- The minor arc is denoted using two letters.
- The minor arc is equal to the measure of its central angle.

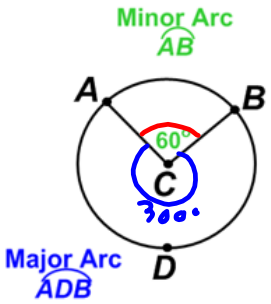
Arc that is exactly 180° - semicircle



$\overset{\frown}{ACB}$ or $\overset{\frown}{ADB}$

MAJOR ARC - The longer arc connecting two points on a circle.

- A major arc is between 180° and 360°.
- The major arc is denoted using three letters.
- The major arc is equal to the difference of 360° and the measure of the related minor arc.



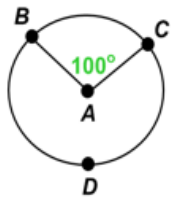
$m\overset{\frown}{AB} = 60°$

$m\overset{\frown}{ADB} = 360° - 60°$
$= 300°$

Examples

For #1 and 2 identify a major and minor arc and then find their measures.

1.

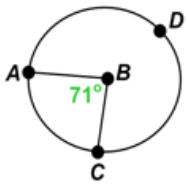


360 - 100

Major: $\overset{\frown}{BDC}$
260°

Minor: $\overset{\frown}{BC}$
100°

2.

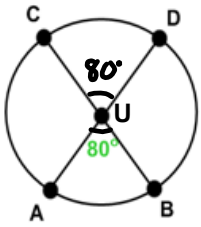


Major: $\overset{\frown}{ADC}$
289°

Minor: $\overset{\frown}{AC}$
71°

For #3 and 4, find the measures of $\overset{\frown}{AB}$ and $\overset{\frown}{CD}$ in circle U. Are the arcs congruent?

3.

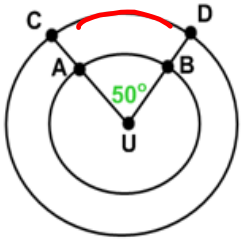


$m\overset{\frown}{AB} = 80°$

$m\overset{\frown}{CD} = 80°$

Yes, $\overset{\frown}{AB} \cong \overset{\frown}{CD}$

4.

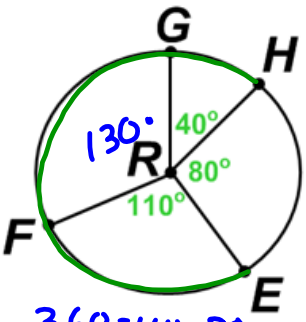


$m\overset{\frown}{AB} = 50°$

$m\overset{\frown}{CD} = 50°$

No, since the circles have different radii.

5. Given the circle *R* below, find the measure of the following arcs.



360-110-80-40 = 130

minor arc

a. $m\overset{\frown}{GE}$ = 120°

b. $m\overset{\frown}{HF}$ = 170°

c. $m\overset{\frown}{HEF}$ = 190°

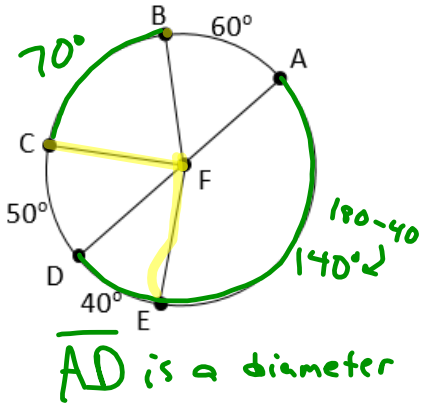
d. $m\overset{\frown}{HFE}$ = 280°

e. $m\overset{\frown}{GFE}$ = 240°

130+110

f. $m\overset{\frown}{FEG}$ = 230°

6. Find the measure of each angle.

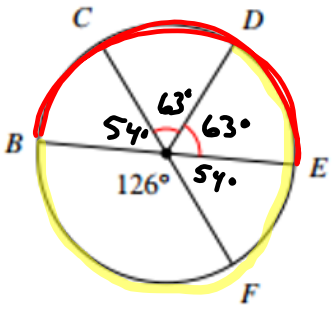


$\overline{AD}$ is a diameter

a. $m\angle DFB =$ 120° b. $m\angle CFB =$ 70°

c. $m\angle CFE =$ 90° d. $m\angle EFA =$ 140°

7. Given the circle below, find each of the following arcs.



a. $m\overset{\frown}{CD} =$ 63° b. $m\overset{\frown}{BD} =$ 117°

c. $m\overset{\frown}{BED} =$ 243° d. $m\overset{\frown}{BDE} =$ 180°

$\overline{BE}$ is a diameter

$\overline{CF}$ is a diameter