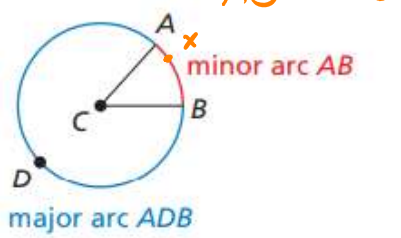
What You Will Learn

- Find arc measures.

Finding Arc Measures

A **central angle** of a circle is an angle whose vertex is the center of the circle. In the diagram, $\angle ACB$ is a central angle of $\odot C$.

If $m\angle ACB$ is less than 180°, then the points on $\odot C$ that lie in the interior of $\angle ACB$ form a **minor arc** with endpoints A and B. The points on $\odot C$ that do not lie on the minor arc AB form a **major arc** with endpoints A and B. A **semicircle** is an arc with endpoints that are the endpoints of a diameter.

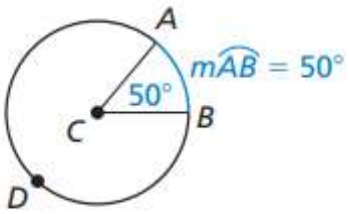


Minor arcs are named by their endpoints. The minor arc associated with $\angle ACB$ is named AB. Major arcs and semicircles are named by their endpoints and a point on the arc. The major arc associated with $\angle ACB$ can be named ADB.

Measuring Arcs

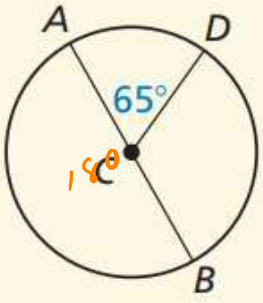
The **measure of a minor arc** is the measure of its central angle. The expression $m\overset{\frown}{AB}$ is read as "the measure of arc AB."

The measure of the entire circle is 360°. The **measure of a major arc** is the difference of 360° and the measure of the related minor arc. The measure of a semicircle is 180°.



$m\overset{\frown}{ADB} = 360° - 50° = 310°$

Find the measure of each arc of $\odot C$, where $\overline{AB}$ is a diameter.



a. $\overset{\frown}{AD}$

b. $\overset{\frown}{DAB}$

c. $\overset{\frown}{BDA}$

$m\overset{\frown}{AD} = 65°$

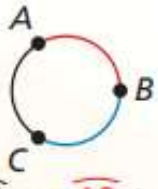
$m\overset{\frown}{DAB} = 245°$

$m\overset{\frown}{BDA} = 180°$

180
65
245

Postulate 10.1 Arc Addition Postulate

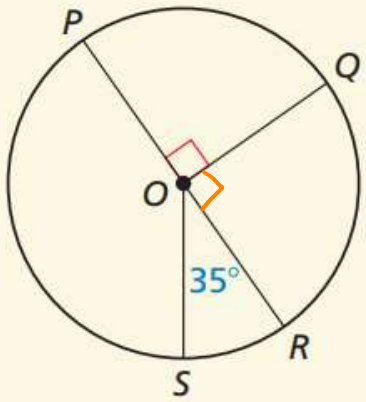
The measure of an arc formed by two adjacent arcs is the sum of the measures of the two arcs.



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

Same idea as Ruler Addition Postulate
Angle Addition Postulate

Find the measure of each arc.



a. $\overset{\frown}{SQ}$
b. $\overset{\frown}{RPQ}$
c. $\overset{\frown}{PRS}$

$m\overset{\frown}{SQ} = 125°$

$m\overset{\frown}{RPQ} = 270°$

$m\overset{\frown}{PRS} = 215°$

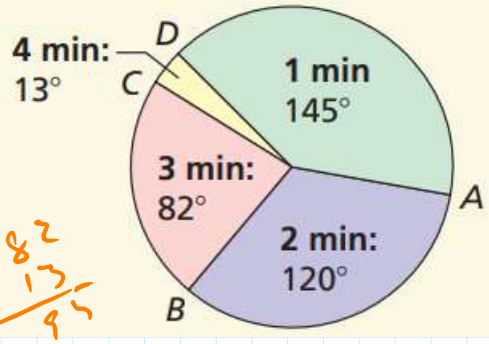
$360 - 90 = 270$

$180 + 90 = 270$

$90 + 90 + 35 = 215$

A survey asked people how many minutes they spend brushing their teeth each morning. The circle graph shows the results. Find the indicated arc measures.

For How Long Did You Brush Your Teeth?



360 − 120 = 240

82 + 13 = 95

360 − 13 = 347

a. $m\overset{\frown}{ABC} = 202°$

b. $m\overset{\frown}{ACB} = 240°$

c. $m\overset{\frown}{BD} = 95°$

d. $m\overset{\frown}{CBD} = 347°$

Practice *sec 10.2* **pg. 542: 3-17A**