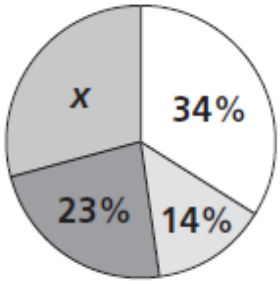
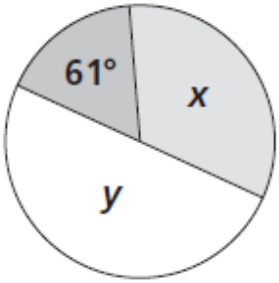
Determine the value of *x* for the circle graph. Pay close attention to the units.

1.



$x = 29\%$

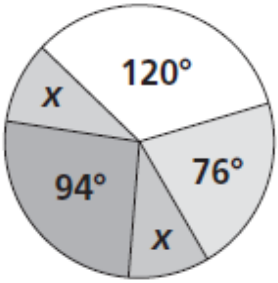
2.



$x = 119°$

$y = 180°$

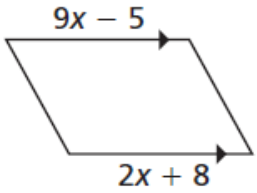
3.



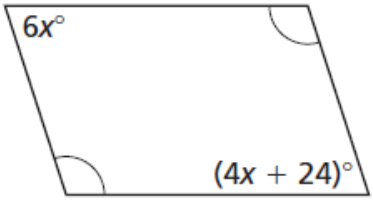
$x = 35°$

Find the value of *x* that makes the quadrilateral a parallelogram.

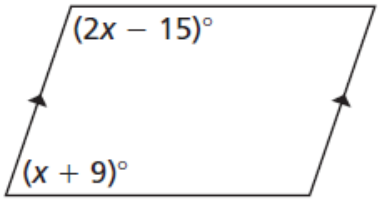
1.



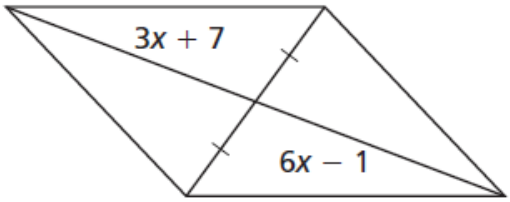
2.



3.



4.

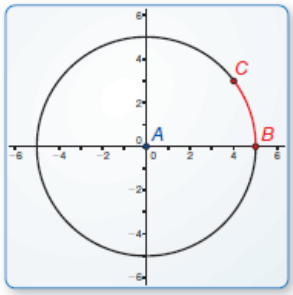


Essential Question

How are circular arcs measured?

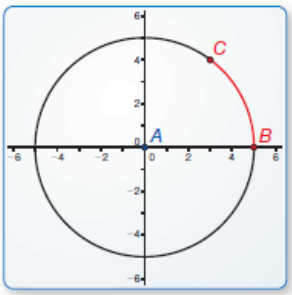
Work with a partner. Use dynamic geometry software to find the measure of $\overset{\frown}{BC}$. Verify your answers using trigonometry.

a.



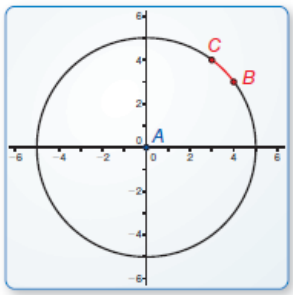
Points
$A(0, 0)$
$B(5, 0)$
$C(4, 3)$

b.



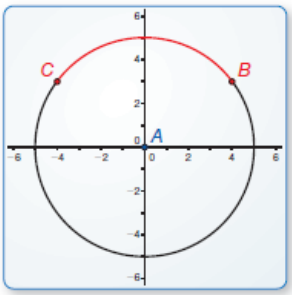
Points
$A(0, 0)$
$B(5, 0)$
$C(3, 4)$

c.



Points
$A(0, 0)$
$B(4, 3)$
$C(3, 4)$

d.



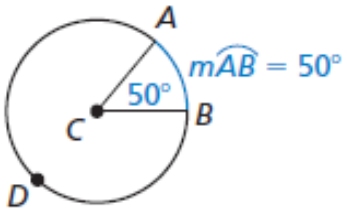
Points
$A(0, 0)$
$B(4, 3)$
$C(-4, 3)$

Core Concept

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°.



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

Arc vs arch

An **arc** is a curved shape or the curving path of a moving object. In mathematics, an *arc* is part of a circle's circumference. An *arc* is also a sparking discharge conducted from one electrode to another. The verb forms of *arc* are *arcs, arced* and *arcing. Arched* and *arcking* are technically correct forms, but rarely used. *Arc* comes from the Old French *arc* meaning *bowed or curved.*

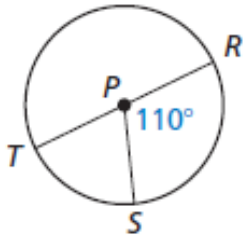
An **arch** is a curved structure that spans an opening and usually supports a bridge or roof. An *arch* may also be a decorative feature. *Arch* may describe many parts of the human body, such as the *arch* of the foot. *Arch* may also be used as a verb, *arches, arched* and *arching* are verb forms. *Arch* comes form the Old French *arche,* which means *bow or arc.*

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

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

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

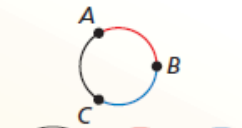
c. $\overset{\frown}{RST}$



Postulate

Postulate 10.1 Arc Addition Postulate

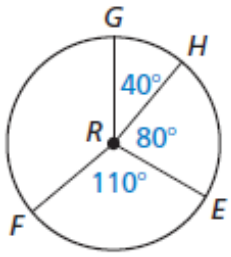
The measure of an arc formed by two adjacent arcs is the sum of the measures of the two arcs.



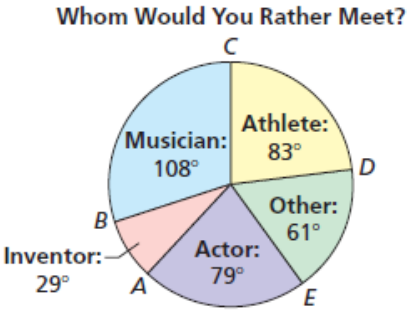
$m\overset{\frown}{ABC} = m\overset{\frown}{AB} + m\overset{\frown}{BC}$

Find the measure of each arc.

a. $\overset{\frown}{GE}$ **b.** $\overset{\frown}{GEF}$ **c.** $\overset{\frown}{GF}$



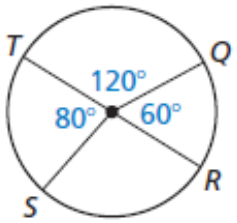
A recent survey asked teenagers whether they would rather meet a famous musician, athlete, actor, inventor, or other person. The circle graph shows the results. Find the indicated arc measures.



a. $m\overset{\frown}{AC}$ **b.** $m\overset{\frown}{ACD}$

c. $m\overset{\frown}{ADC}$ **d.** $m\overset{\frown}{EBD}$

Identify the given arc as a *major arc*, *minor arc*, or *semicircle*. Then find the measure of the arc.



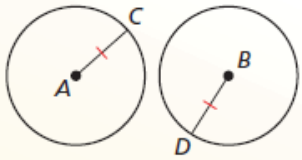
1. $\overset{\frown}{TQ}$ **2.** $\overset{\frown}{QRT}$ **3.** $\overset{\frown}{TQR}$

4. $\overset{\frown}{QS}$ **5.** $\overset{\frown}{TS}$ **6.** $\overset{\frown}{RST}$

Theorem

Theorem 10.3 Congruent Circles Theorem

Two circles are congruent circles if and only if they have the same radius.



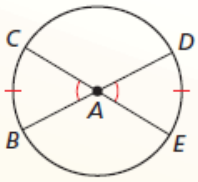
Proof Ex. 35, p. 544

$\odot A \cong \odot B$ if and only if $\overline{AC} \cong \overline{BD}$.

Theorem

Theorem 10.4 Congruent Central Angles Theorem

In the same circle, or in congruent circles, two minor arcs are congruent if and only if their corresponding central angles are congruent.

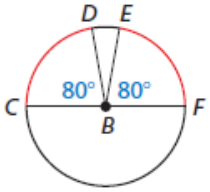


$\overset{\frown}{BC} \cong \overset{\frown}{DE}$ if and only if $\angle BAC \cong \angle DAE$.

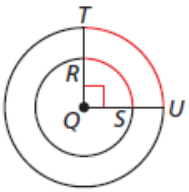
Proof Ex. 37, p. 544

Tell whether the red arcs are congruent. Explain why or why not.

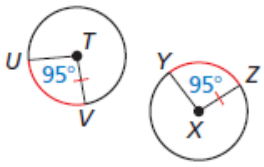
a.



b.

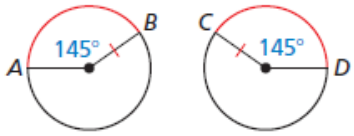


c.

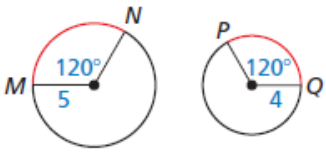


Tell whether the red arcs are congruent. Explain why or why not.

7.



8.



Theorem

Theorem 10.5 Similar Circles Theorem

All circles are similar.

Proof p. 541; Ex. 33, p. 544

• **Exit Ticket:** Phone a friend who was absent today and describe three key ideas from today's lesson.