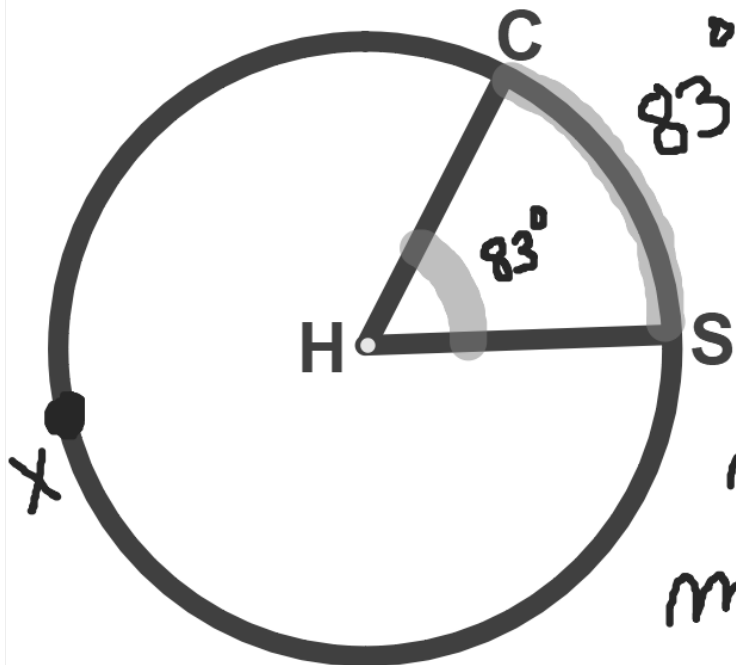


Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

central angle: angle whose vertex is the center of the circle and whose sides are radii
-central angles separate a circle into arcs
-arcs are measured by their central angle

$\angle CHS$



arc- a portion of a circle defined by 2 endpoints.

\widehat{CS} or \widehat{SC}

$$m\widehat{CS} = 83^\circ$$

$$m\widehat{CXs} = 360 - 83 = 277^\circ$$

Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

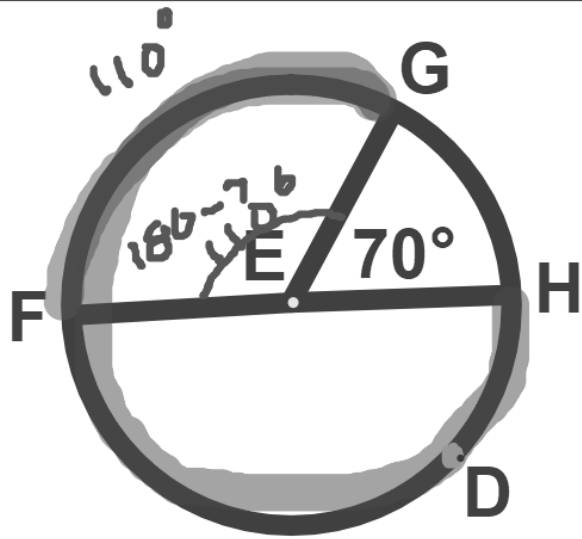
minor arc: arc that measures less than 180 and is equal to the measure of its central angle.
named with 2 letters (the endpoints)

semicircle: arc whose measure is 180
named with 3 letters (endpoints +1)

major arc:
arc that measures between 180 and 360
named with 3 letters (endpoints +1)
It is equal to 360 minus the minor arc
with the same endpoints.

Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.



Minor Arc \widehat{GH} \widehat{FG}

Major Arc \widehat{GFD} \widehat{GFH} \widehat{DFH}

Semicircle \widehat{HDF} \widehat{FGH}

$$m\widehat{GH} = 70^\circ \quad m\widehat{FDH} = 180^\circ \quad m\widehat{GF} = 110^\circ \quad m\widehat{HDG} = 290^\circ$$

$$360 - 70$$

Theorem: Two minor arcs are congruent if and only if their central angles are congruent.

Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

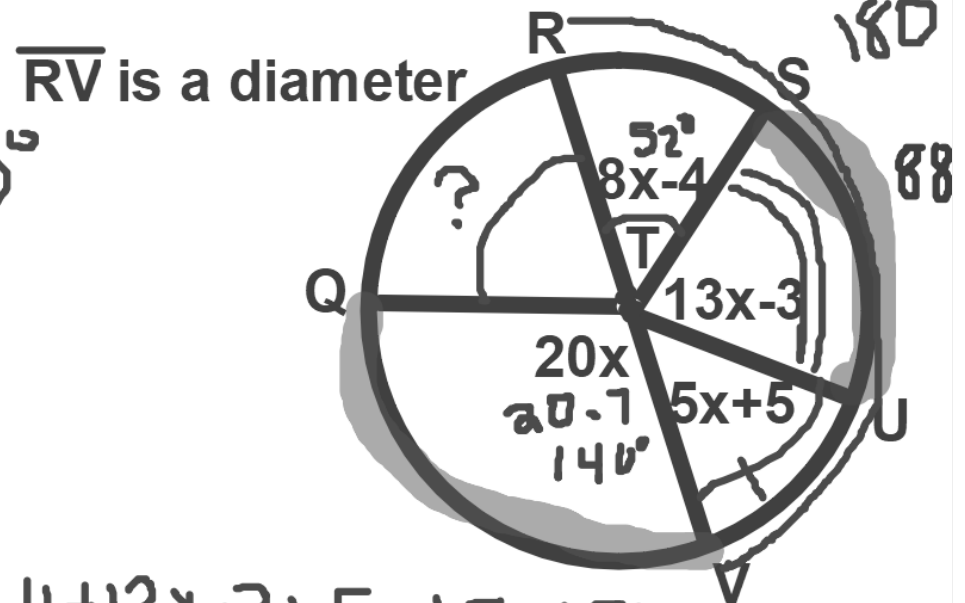
Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

$$1. m\angle RTS = 8(7) - 4 = 52^\circ$$

$$2. m\angle QTR = 180 - 40 = 140^\circ$$

$$3. m\widehat{SU} = 13(7) - 3 = 88^\circ$$

$$4. m\widehat{QV} = 140^\circ$$



$$\frac{8x-4}{\quad} + \frac{13x-3}{\quad} + \frac{5x+5}{\quad} = 180$$

$$26x - 2 = 180$$

$$\frac{26x}{26} = \frac{182}{26}$$

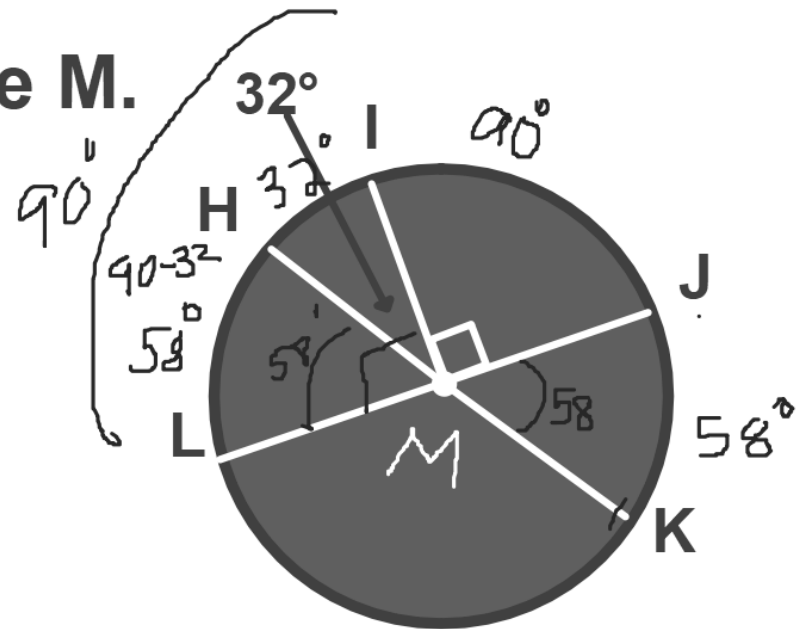
$$x = 7$$

Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

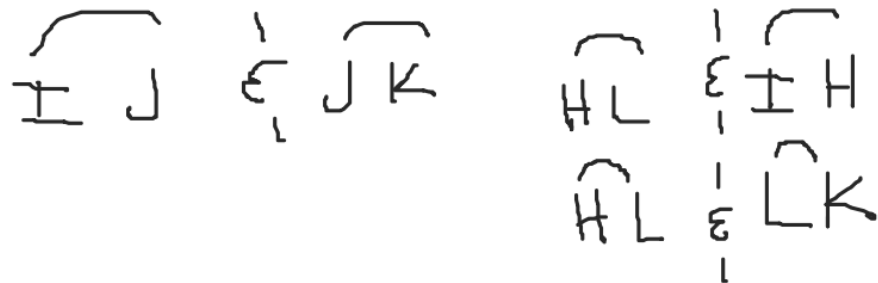
Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

5. Find each measure in circle M.

- a. $m\widehat{LI} = 90^\circ$
- b. $m\widehat{IKJ} = 360 - 90 = 270^\circ$
- c. $m\widehat{HL} = 58^\circ$
- d. $m\widehat{JK} = 58^\circ$



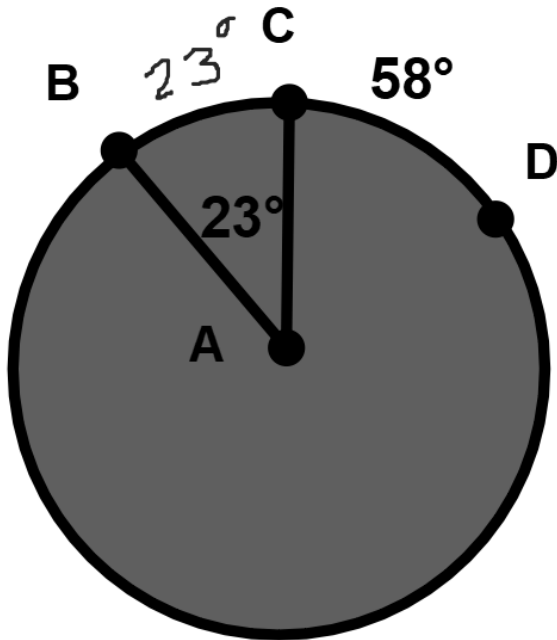
adjacent arcs: arcs of a circle with exactly one point in common



Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

Arc Addition Postulate: The measure of an arc formed by 2 adjacent arcs is the sum of the measures of the 2 arcs.



$$m\widehat{BD} = m\widehat{BC} + m\widehat{CD}$$
$$23^\circ + 58^\circ$$

↓

$$81^\circ$$

Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

arc length: part of the circumference of a circle measured by length NOT by degree.

$$l = \frac{m}{360} (2\pi r)$$

l = arc length ^{in ft or cm}
 m = measure of arc
 degrees

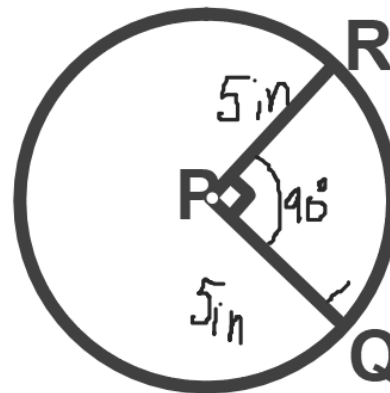
$$\frac{m}{360} = \frac{l}{2\pi r}$$

6. Find the length of \widehat{RQ} .

Round to the nearest hundredth.

$$l = \frac{90}{360} 2\pi (5)$$

$$l = 7.85 \text{ in}$$

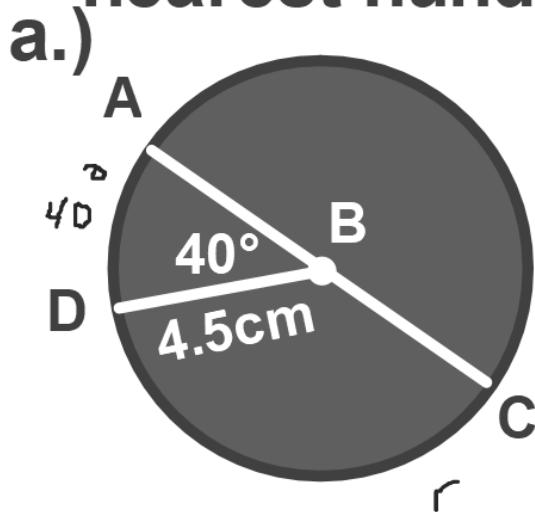


In $\odot P$,
 $PR = 5 \text{ in}$

Unit 9 Lesson 2 (section 10-2) Measuring Angles & Arcs

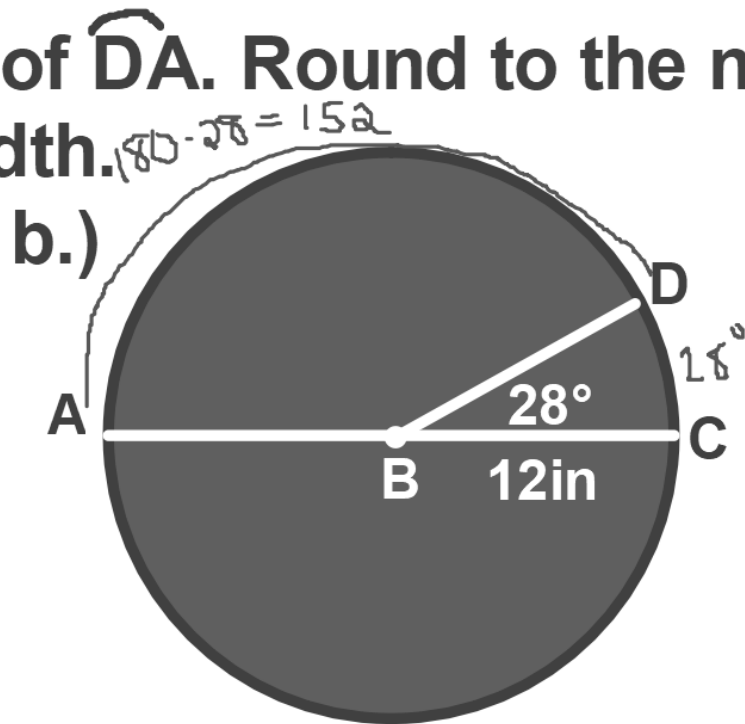
Objectives: Identify central angles, major arcs, minor arcs, and semicircles, and find their measures. Also find arc lengths.

7. Find the length of \widehat{DA} . Round to the nearest nearest hundredth.



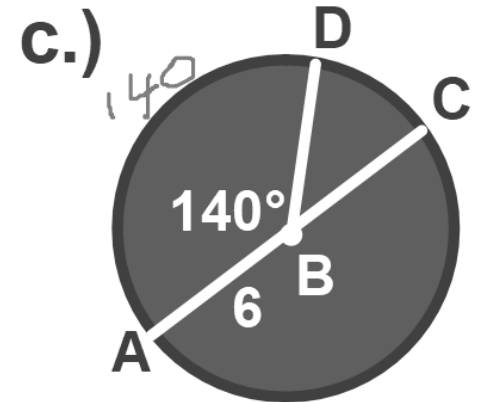
$$l = \frac{40}{360} 2\pi(4.5)$$

$$l \approx 3.14 \text{ cm}$$



$$l = \frac{152}{360} 2\pi(12)$$

$$\approx 31.83 \text{ in}$$



$$l = \frac{140}{360} 2\pi(6)$$

$$\approx 14.66$$