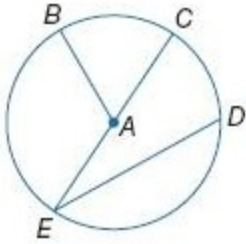


Mid-Chapter Quiz: Lessons 10-1 through 10-4

Refer to $\odot A$.



1. Name the circle.

SOLUTION:

The center of the circle is A . Therefore, the circle is $\odot A$.

ANSWER:

$\odot A$

2. Name a diameter.

SOLUTION:

\overline{EC} ; since \overline{EC} is a chord that passes through the center, it is a diameter.

ANSWER:

\overline{EC}

3. Name a chord that is not a diameter.

SOLUTION:

\overline{ED} ; the chord \overline{ED} does not pass through the center of the circle, so it is not a diameter.

ANSWER:

\overline{ED}

Mid-Chapter Quiz: Lessons 10-1 through 10-4

4. **BICYCLES** A bicycle has tires that are 24 inches in diameter.
- Find the circumference of one tire.
 - How many inches does the tire travel after 100 rotations?

SOLUTION:

a.

$$\begin{aligned}C &= \pi d && \text{Circumference Formula} \\ &= \pi(24) && d = 24 \\ &\approx 75.4 && \text{Use a calculator.}\end{aligned}$$

Therefore, the circumference of one tire is about 75.4 inches.

b.

$$\begin{aligned}\text{Distance} &= (\text{number of rotations})(C_{\text{tire}}) \\ &= (100)(75.4) && \text{Substitution} \\ &= 7540 && \text{Multiply.}\end{aligned}$$

Therefore, the tire travels about 7540 inches in 100 rotations.

ANSWER:

- 75.4 in.
- 7540 in.

Find the diameter and radius of a circle with the given circumference. Round to the nearest hundredth.

5. $C = 23$ cm

SOLUTION:

Use the circumference to find the diameter.

$$\begin{aligned}C &= \pi d && \text{Circumference Formula} \\ 23 &= \pi d && \text{Substitution} \\ \frac{23}{\pi} &= d && \text{Divide each side by } \pi.\end{aligned}$$

$$7.32 \approx d \quad \text{Use a calculator.}$$

Therefore, the diameter is about 7.32 centimeters.

The radius is half the diameter. So, the radius of the circle is $\frac{1}{2}(7.32)$ or about 3.66 centimeters.

ANSWER:

3.66 cm; 7.32 cm

Mid-Chapter Quiz: Lessons 10-1 through 10-4

6. $C = 78$ ft

SOLUTION:

Use the circumference to find the diameter.

$$C = \pi d \quad \text{Circumference Formula}$$

$$78 = \pi d \quad \text{Substitution}$$

$$\frac{78}{\pi} = d \quad \text{Divide each side by } \pi.$$

$$24.83 \approx d \quad \text{Use a calculator.}$$

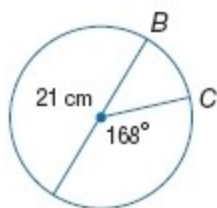
Therefore, the diameter is about 24.83 feet.

The radius is half the diameter. So, the radius of the circle is $\frac{1}{2}(24.83)$ or about 12.41 feet.

ANSWER:

12.41 ft; 24.83 ft

7. **MULTIPLE CHOICE** Find the length of \widehat{BC} .



A 18°

B 2.20 cm

C 168°

D 30.79 cm

SOLUTION:

The minor arc adjacent to arc BC has a measure of 168, since it is equal to its related central angle.

This arc and arc BC form a semicircle.

$$m(\widehat{BC}) + 168 = 180 \quad \text{Arc Addition Postulate}$$

$$m(\widehat{BC}) = 12 \quad \text{Subtract 168 from each side.}$$

The diameter is 21 centimeters, so the radius is $\frac{1}{2}(21)$ or 10.5 centimeters.

Use $m = 12$ and $r = 10.5$ to find the length of arc BC .

$$l = \frac{x}{360} 2\pi r \quad \text{Arc Length Equation}$$

$$= \frac{12}{360} 2\pi(10.5) \quad m = 12; r = 10.5$$

$$= \frac{252\pi}{360} \quad \text{Simplify.}$$

$$\approx 2.20 \quad \text{Use a calculator.}$$

Therefore, the length of arc BC is about 2.20 centimeters.

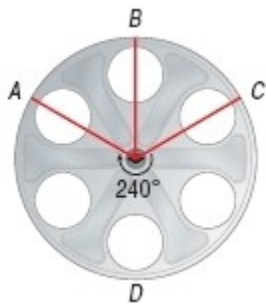
So, the correct choice is B.

ANSWER:

B

Mid-Chapter Quiz: Lessons 10-1 through 10-4

8. **MOVIES** The movie reel shown below has a diameter of 14.5 inches.



- a. Find $m\widehat{ADC}$.
b. Find the length of \widehat{ADC} .

SOLUTION:

a. The measure of an arc is equal to its related central angle. Since the central angle related to arc ADC is 240, the measure of arc ADC is 240.

b. Use $m = 240$ and $r = \frac{1}{2}(14.5)$ or 7.25 to find the length of arc ADC .

$$l = \frac{x}{360} 2\pi r \quad \text{Arc Length Equation}$$

$$= \frac{240}{360} 2\pi(7.25) \quad m = 240; r = 7.25$$

$$= \frac{3480\pi}{360} \quad \text{Simplify.}$$

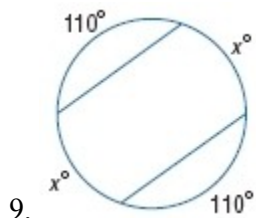
$$\approx 30.4 \quad \text{Multiply each side by } \frac{360}{680\pi}.$$

Therefore, the length of arc ADC is about 30.4 inches.

ANSWER:

- a. 240
b. 30.4 in.

Find the value of x .



SOLUTION:

The sum of the measures of the arcs of a circle is 360.

$$x + 110 + x + 110 = 360 \quad \text{Sum of arcs of a circle is 360.}$$

$$2x + 220 = 360 \quad \text{Simplify.}$$

$$2x = 140 \quad \text{Subtract 220 from each side.}$$

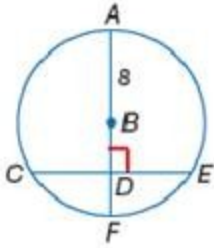
$$x = 70 \quad \text{Divide each side by 2.}$$

ANSWER:

70

Mid-Chapter Quiz: Lessons 10-1 through 10-4

10. In $\odot B$, $CE = 13.5$. Find BD . Round to the nearest hundredth.



SOLUTION:

Since \overline{BF} is a radius and is perpendicular to the chord \overline{CE} , it bisects \overline{CE} . So, $CD = \frac{1}{2}(13.5)$ or 6.75.

Draw radius \overline{BC} to complete right triangle BCD . Use the Pythagorean Theorem to find BD .

$$BD^2 + CD^2 = BC^2 \quad \text{Pythagorean Theorem}$$

$$BD^2 + 6.75^2 = 8^2 \quad CD = 6.75, BC = AB = 8$$

$$BD^2 + 45.5625 = 64 \quad \text{Simplify.}$$

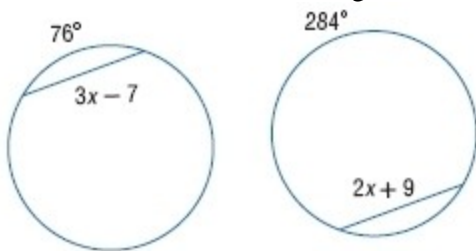
$$BD^2 = 18.4375 \quad \text{Subtract 45.5625 from each side.}$$

$$BD \approx 4.29 \quad \text{Take the positive square root of each side.}$$

ANSWER:

4.29

11. The two circles shown are congruent. Find x and the length of the chord.



SOLUTION:

In the same circle or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent. Here, the measure of the minor arc in the second circle is $360 - 284$ or 76. So, the minor arcs in the two circles are congruent. Then, the corresponding chords are also congruent.

$$3x - 7 = 2x + 9 \quad \text{Equal arcs cut equal chords.}$$

$$x = 16 \quad \text{Add 7 and } -2x \text{ to each side.}$$

Use the value of x to find the length of each chord.

$$3x - 7 = 3(16) - 7 \text{ or } 41$$

Therefore, the value of x is 16 and the length of each chord is 41.

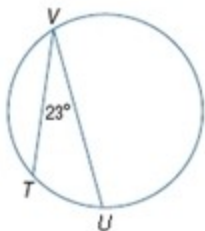
ANSWER:

$x = 16$; 41

Mid-Chapter Quiz: Lessons 10-1 through 10-4

Find each measure.

12. $m\widehat{TU}$



SOLUTION:

$\angle TVU$ is an inscribed angle.

$$m\angle TVU = \frac{1}{2}[m(\text{arc } TU)] \quad \text{Theorem 10.6}$$

$$23 = \frac{1}{2}[m(\text{arc } TU)] \quad \text{Substitution}$$

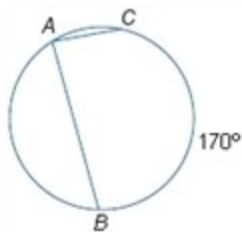
$$46 = m(\text{arc } TU) \quad \text{Multiply each side by 2.}$$

Therefore, the measure of arc TU is 46.

ANSWER:

46

13. $m\angle A$



SOLUTION:

$\angle A$ is an inscribed angle.

$$m\angle A = \frac{1}{2}[m(\text{arc } BC)] \quad \text{Theorem 10.6}$$

$$= \frac{1}{2}[170] \quad \text{Substitution}$$

$$= 85 \quad \text{Multiply.}$$

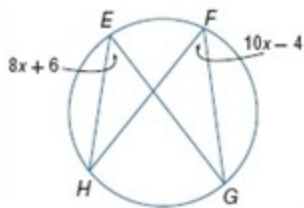
Therefore, the measure of $\angle A$ is 85.

ANSWER:

85

Mid-Chapter Quiz: Lessons 10-1 through 10-4

14. **MULTIPLE CHOICE** Find x .



- F** 1.8
G 5
H 46
J 90

SOLUTION:

If two inscribed angles of a circle intercept the same arc or congruent arcs, then the angles are congruent.

$$m\angle E = m\angle F \quad \text{Inscribed angles that intercept the same arc are congruent.}$$

$$8x + 6 = 10x - 4 \quad \text{Substitution}$$

$$10 = 2x \quad \text{Add } -8x \text{ and } 4 \text{ to each side.}$$

$$5 = x \quad \text{Divide each side by 2.}$$

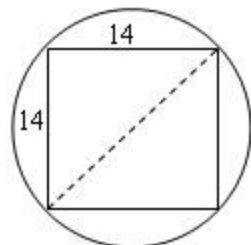
Therefore, the correct choice is G.

ANSWER:

G

15. If a square with sides of 14 inches is inscribed in a circle, what is the diameter of the circle?

SOLUTION:



When a square is inscribed in a circle, each diagonal of the square will be a diameter. Use the Pythagorean Theorem to find the length of a diagonal.

$$c^2 = a^2 + b^2 \quad \text{Pythagorean Theorem}$$

$$c^2 = 14^2 + 14^2 \quad \text{Substitution}$$

$$c^2 = 392 \quad \text{Simplify.}$$

$$c = \sqrt{392} \quad \text{Take the positive square root of each side.}$$

$$c = 14\sqrt{2} \quad \text{Take the positive square root of each side.}$$

Therefore, the diameter of the circle is $14\sqrt{2}$ inches.

ANSWER:

$14\sqrt{2}$ in.