

10-1

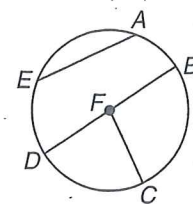
Study Guide and Intervention

Circles and Circumference

Parts of Circles A circle consists of all points in a plane that are a given distance, called the **radius**, from a given point called the **center**.

A segment or line can intersect a circle in several ways.

- A segment with endpoints that are the center of the circle and a point of the circle is a **radius**.
- A segment with endpoints that lie on the circle is a **chord**.
- A chord that contains the circle's center is a **diameter**.



chord: \overline{AE} , \overline{BD}
 radius: \overline{FB} , \overline{FC} , \overline{FD}
 diameter: \overline{BD}

Example

a. Name the circle.

The name of the circle is $\odot O$.

b. Name radii of the circle.

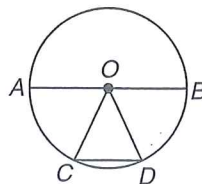
\overline{AO} , \overline{BO} , \overline{CO} , and \overline{DO} are radii.

c. Name chords of the circle.

\overline{AB} and \overline{CD} are chords.

d. Name a diameter of the circle.

\overline{AB} is a diameter.



Exercises

1. Name the circle.

circle R or $\odot R$

2. Name radii of the circle.

\overline{AR} , \overline{XR} , \overline{YR} , \overline{BR}

3. Name chords of the circle.

\overline{AX} , \overline{BY} , \overline{AB} , \overline{XY}

4. Name diameters of the circle.

\overline{AB} or \overline{XY}

5. Find AR if AB is 18 millimeters.

$$AR = \frac{1}{2}(AB) = \frac{1}{2}(18) = \boxed{9\text{mm}}$$

6. Find AR and AB if RY is 10 inches.

$$RY \cong AR$$

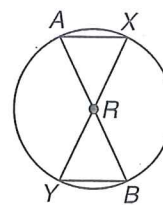
$$AB = 2(AR)$$

$$\boxed{AR = 10\text{in}}$$

$$AB = 2(10) = \boxed{20\text{in}}$$

7. Is $\overline{AB} \cong \overline{XY}$? Explain.

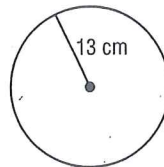
Yes, diameters of a circle are \cong .



10-1 Study Guide and Intervention (continued)**Circles and Circumference****Circumference** The circumference of a circle is the distance around the circle.**Circumference**For a circumference of C units and a diameter of d units or a radius of r units,
 $C = \pi d$ or $C = 2\pi r$.**Example**

Find the circumference of the circle to the nearest hundredth.

$$\begin{aligned} C &= 2\pi r && \text{Circumference formula} \\ &= 2\pi(13) && r = 13 \\ &\approx 81.68 && \text{Use a calculator.} \end{aligned}$$



The circumference is about 81.68 centimeters.

Exercises

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

1. $r = 8$ cm

$C = 50.27$ cm

2. $r = 3\sqrt{2}$ ft

$C = 26.66$ ft

3. $r = 4.1$ cm

$C = 25.76$ cm

4. $d = 10$ in.

$C = 31.42$ in

5. $d = \frac{1}{3}$ m

$C = 1.05$ m

6. $d = 18$ yd

$C = 56.55$ yd

The radius, diameter, or circumference of a circle is given. Find the missing measures to the nearest hundredth.

7. $r = 4$ cm

$d = 8$ cm, $C = 8\pi \approx 25.13$ cm

8. $d = 6$ ft

$r = 3$ ft, $C = 6\pi \approx 18.85$ ft

9. $r = 12$ cm

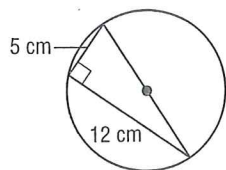
$d = 24$ cm, $C = 24\pi \approx 75.4$ cm

10. $d = 15$ in.

$r = 7.5$ in, $C = 15\pi \approx 47.12$ in

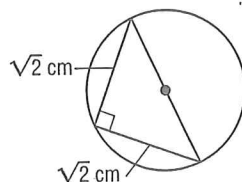
Find the exact circumference of each circle.

11.



$C = 13\pi$ cm

12.



$C = 2\pi$ cm

10-1 Lesson Reading Guide

Key

Circles and Circumference

Get Ready for the Lesson

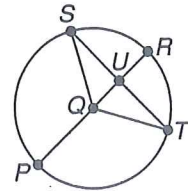
Read the introduction to Lesson 10-1 in your textbook.

How could you measure the approximate distance around the circular carousel using everyday measuring devices?

Read the Lesson

1. Refer to the figure.

- Name the circle. *circle Q or $\odot Q$*
- Name four radii of the circle. *\overline{QP} , \overline{QR} , \overline{QS} , \overline{QT}*
- Name a diameter of the circle. *\overline{PR}*
- Name two chords of the circle. *\overline{PR} and \overline{ST}*



2. Match each description from the first column with the best term from the second column. (Some terms in the second column may be used more than once or not at all.)

- | | | |
|---|------------|------------------|
| a. a segment other than the diameter endpoints on a circle | <i>iii</i> | i. radius |
| b. the set of all points in a plane that are the same distance from a given point | <i>iv</i> | ii. diameter |
| c. the distance between the center of a circle and any point on the circle | <i>i</i> | iii. chord |
| d. a chord that passes through the center of a circle | <i>ii</i> | iv. circle |
| e. a segment whose endpoints are the center and any point on a circle | <i>i</i> | v. circumference |
| f. a chord made up of two collinear radii | <i>ii</i> | |
| g. the distance around a circle | <i>v</i> | |

3. Which equations correctly express a relationship in a circle?

A. $d = 2r$

B. $C = \pi r$

C. $C = 2d$

D. $d = \frac{C}{\pi}$

E. $r = \frac{d}{\pi}$

F. $C = r^2$

G. $C = 2\pi r$

H. $d = \frac{1}{2}r$

Remember What You Learned

4. A good way to remember a new geometric term is to relate the word or its parts to geometric terms you already know. Look up the origins of the two parts of the word *diameter* in your dictionary. Explain the meaning of each part and give a term you already know that shares the origin of that part.

*dia: across or through, as in diagonal
metron: measure, as in geometry*