Geometry 10.1

Identify and use parts of circles

Solve circumference and area problems*

circle name circle A ⊙A

center fixed in a plane

radius C → circle

chord (of a circle) segment

diameter chord @ center

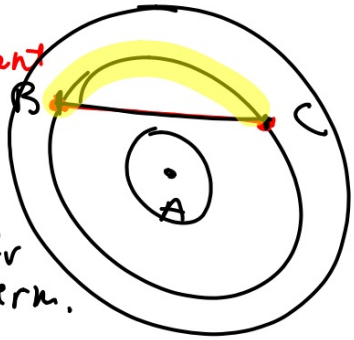
concentric coplanar

pi $\pi \approx 3.14$ same center

irrational non rep, nonterm.

inscribed $\sqrt{17}$

circumscribed




* 7th grade standard

p. 697

**1 Segments in Circles** A **circle** is the locus or set of all points in a plane equidistant from a given point called the **center** of the circle.

Segments that intersect a circle have special names.

Circle C or ⊙C

## KeyConcept Special Segments in a Circle

A **radius** (plural radii) is a segment with endpoints at the center and on the circle.

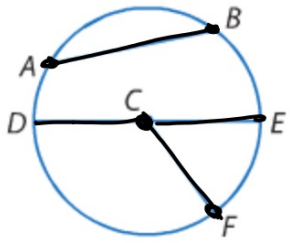
**Examples** $\overline{CD}$, $\overline{CE}$, and $\overline{CF}$ are radii of $\odot C$.

A **chord** is a segment with endpoints on the circle.

**Examples** $\overline{AB}$ and $\overline{DE}$ are chords of $\odot C$.

A **diameter** of a circle is a chord that passes through the center and is made up of collinear radii.

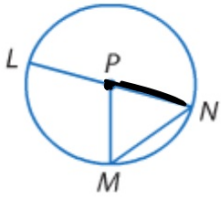
**Example** $\overline{DE}$ is a diameter of $\odot C$. Diameter $\overline{DE}$ is made up of collinear radii $\overline{CD}$ and $\overline{CE}$.



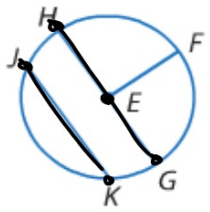
## Example 1 Identify Segments in a Circle

**a.** Name the circle and identify a radius.

⊙P $\overline{PN}$ = radius




**b.** Identify a chord and a diameter of the circle.



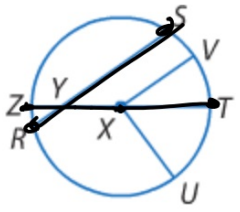

⊙E

chord $\overline{JK}$

diam $\overline{HG}$

## GuidedPractice

**1.** Name the circle, a radius, a chord, and a diameter of the circle.




⊙X

rad. $\overline{XV}$

chord. $\overline{SR}$

diam. $\overline{ZT}$

## KeyConcept Radius and Diameter Relationships

If a circle has radius $r$ and diameter $d$, the following relationships are true.

Radius $r$ Diameter $d$

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

### Example 2 Find Radius and Diameter

If $QV = 8$ inches, what is the diameter of $\odot Q$?

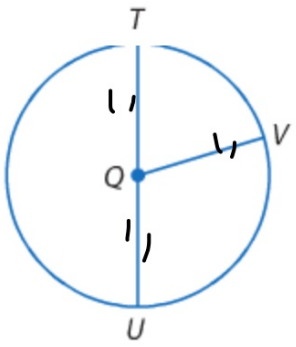
16 in

**2A.** If $TU = 14$ feet, what is the radius of $\odot Q$?

**2B.** If $QT = 11$ meters, what is $QU$?

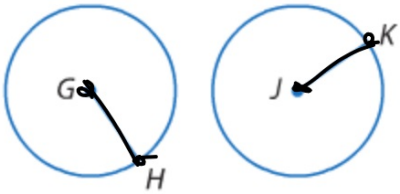
7 ft

11 m



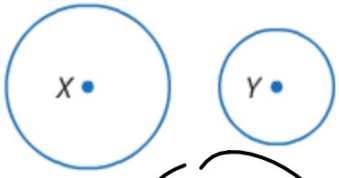
## KeyConcept Circle Pairs

Two circles are congruent if and only if they have congruent radii.



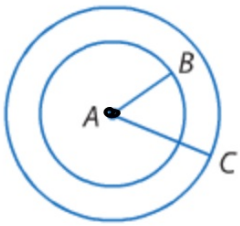

**Example** $\overline{GH} \cong \overline{JK}$, so $\odot G \cong \odot J$.

All circles are similar.




**Example** $\odot X \sim \odot Y$

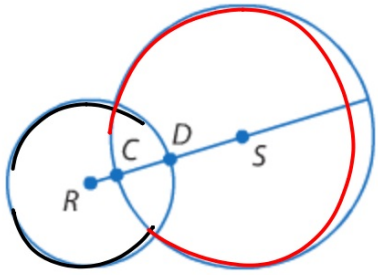
**Concentric circles** are coplanar circles that have the same center.

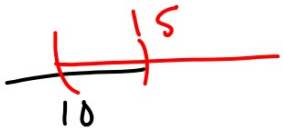



**Example** $\odot A$ with radius $\overline{AB}$ and $\odot A$ with radius $\overline{AC}$ are concentric.

**Example 3** Find Measures in Intersecting Circles

The diameter of $\odot S$ is 30 units, the diameter of $\odot R$ is 20 units, and $DS = 9$ units. Find $CD$.




CR=?

Circle song: 7th grade standard

**KeyConcept Circumference**

| | |
|---|---|
| **Words** | If a circle has diameter $d$ or radius $r$, the circumference $C$ equals the diameter times pi or twice the radius times pi. |
| **Symbols** | $C = \pi d$ |

$A = \pi r^2$

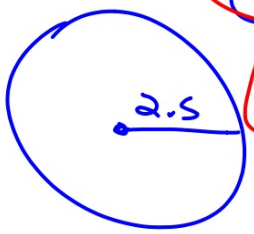
Exact answer (in terms of π) vs. rounded off answer (specific number of decimal places)
Follow directions

## GuidedPractice

3.142

**Find the circumference of each circle described. Round to the nearest hundredth.**

**4A.** radius = 2.5 centimeters




$C = \pi \cdot d$

$= \pi \cdot 5$

$= (3.142)(5)$

$= 15.71 \text{ cm}$

**4B.** diameter = 16 feet

$A = \pi r^2$

$= 3.142(2.5)^2$

$= 19.64 \text{ cm}^2$

$= 19.63 \text{ cm}^2$

**Example 5** Find Diameter and Radius

PT

**Find the diameter and radius of a circle to the nearest hundredth if the circumference of the circle is 106.4 millimeters.**

$C = \pi \cdot d$

$106.4 = (3.142) \cdot d$

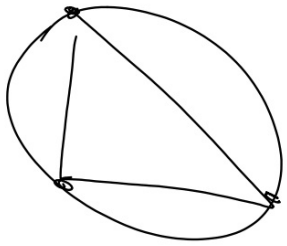
$33.87 = d$

$d = 33.87$ mm

$r = 16.93$ mm

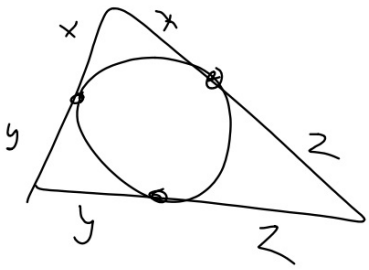
incribed

inside



Circumscribed

outside



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