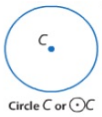
1 Segments in Circles A **circle** is the locus or set of all points in a plane equidistant from a given point called the **center** of the circle.

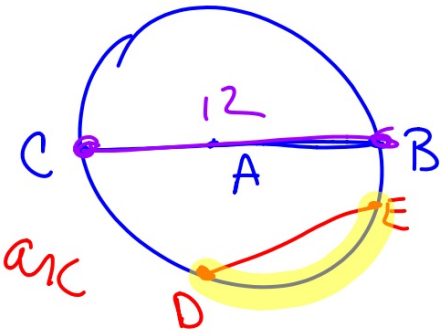
Segments that intersect a circle have special names.



Geometry 10.1
Identify and use parts of circles
Solve circumference and area problems*

* 7th grade standard

circle
center
radius
chord (of a circle)
diameter
concentric
pi
irrational
inscribed
circumscribed



$\overline{DE}$

$\overset{\frown}{DC}$ arc

$\sqrt{17}$ $\sqrt{43}$

$A = \pi r^2$

$C = \pi d$

$= \pi \cdot 12$

$37.699111\ldots$

37.70

KeyConcept Special Segments in a Circle

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

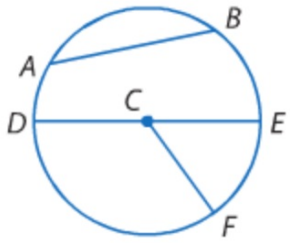
Examples $\overline{CD}$, $\overline{CE}$, and $\overline{CF}$ are radii of $\odot C$.

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

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

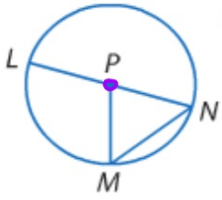
A **diameter** of a circle is a chord that passes through the center and is made up of collinear radii.

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



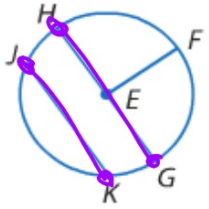
Example 1 Identify Segments in a Circle

a. Name the circle and identify a radius.



$\odot P$ R: $\overline{PN}$ $\overline{PM}$

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

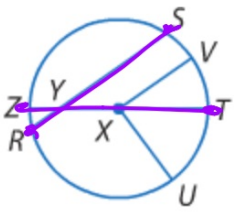


C: $\overline{JK}$

D: $\overline{HG}$

GuidedPractice

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



⊙X

R: $\overline{XT}$

C: $\overline{RS}$

D: $\overline{ZT}$

KeyConcept Radius and Diameter Relationships

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

Radius	Diameter
r	$2r$

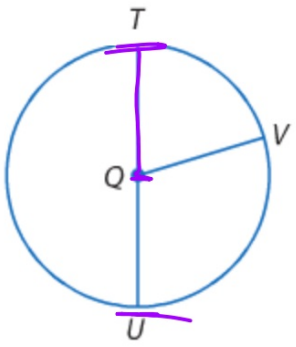
Example 2 Find Radius and Diameter

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

16 in

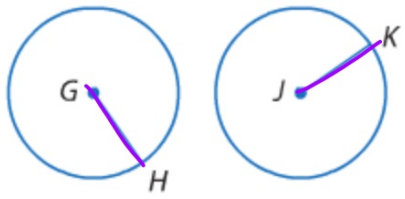
2A. If $TU = 14$ feet, what is the radius of $\odot Q$?

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



KeyConcept Circle Pairs

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

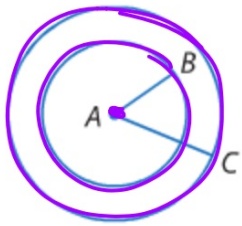


Example $\overline{GH} \cong \overline{JK}$, so $\odot G \cong \odot J$.

All circles are similar.

Example $\odot X \sim \odot Y$

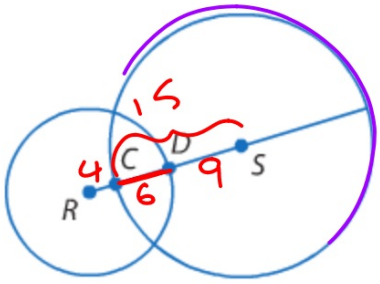
Concentric circles are coplanar circles that have the same center.



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

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

4A. radius = 2.5 centimeters

$C = \pi \cdot 5$

$= 5\pi$

$= 5(\quad)$

$\approx 15.71 \text{ cm}$

4B. diameter = 16 feet

$C = \pi \cdot 16$

$=$

$\approx 50.27 \text{ ft}$

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.

$C = \pi \cdot d$

$\frac{106.4}{\pi} = \frac{\pi d}{\pi}$

$d = 33.87 \text{ mm}$

$r = 16.93 \text{ mm}$

$A = \pi (16.93)^2$

900.46 mm^2

WB 10.1 prac