Lesson 10.1 Circles and Circumference

Sunday, April 23, 2023 4:16 PM

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Lesson 10.1

Lesson 10.1
Circles and Circumference

Workbook pages 189-192

Florida's B.E.S.T. Standards for Mathematics

MA.912.GR.6.1

Solve mathematical and real-world problems involving the length of a secant, tangent, segment or chord in a given circle.

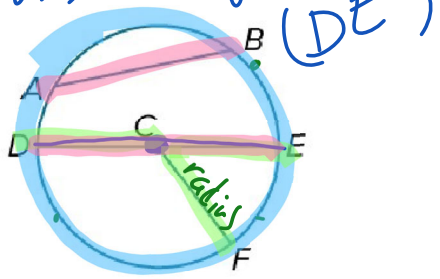
Content Objective
Students find and apply the definitions of radius and diameter to find circumference and measures in intersecting circles.

Learn

Parts of Circles

A **circle** is the set of all points in a plane that are the same distance from a given point called the **center of a circle**. The center of the circle below is C.

diameter (2R) are the ways across through center (DE)



A **radius of a circle** (plural radii) is a line segment from the center to a point on a circle. $\overline{CD}$, $\overline{CE}$, and $\overline{CF}$ are radii of circle C.

A **chord of a circle** is a segment with endpoints on the circle. $\overline{AB}$ and $\overline{DE}$ are chords of circle C.

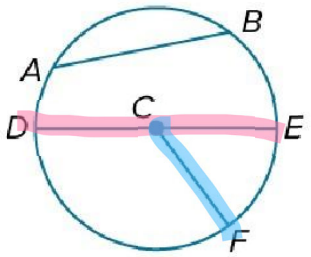
Learn

Learn
Parts of Circles

A **diameter of a circle** is a chord that passes through the center of a circle. $\overline{DE}$ is a diameter of circle C.

All radii r of a circle are congruent. Because a diameter d is composed of two radii, all diameters of a circle are also congruent.

The words *radius* and *diameter* are used to describe lengths as well as segments.



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Learn
Parts of Circles

Key Concept: Circumference Formula

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	$C = \pi d$ or $C = 2\pi r$

$\pi = 3.14$

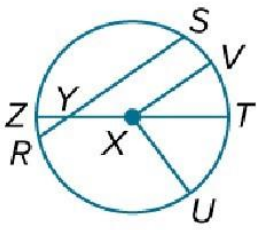
perimeter of (distance) a circle

$C = 2\pi r$

$C = \pi d$

Example 1
Identify Segments in a Circle

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



4
2
1
radii
$\overline{XV}, \overline{XT}, \overline{XU}, \overline{XZ}$
chords
$\overline{RS}, \overline{ZT}$
diameter
$\overline{ZT}$

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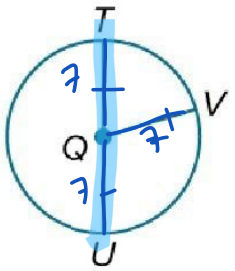
Example 2
Use Radius and Diameter Relationships

If *TU* = 14 feet, what is the radius of ⊙*Q*?

$14/2 = 7$

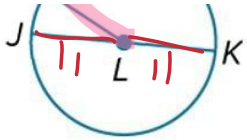


Check

If *LM* = 11 inches, what is the diameter ⊙*L*?

M 11

11(2) = JK = 22



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Example 3
Find Circumference

TRAFFIC CIRCLES Traffic circles, also known as roundabouts, are circular roadways that reflow traffic in one direction around an island. A car enters a traffic circle and is 18 meters from the center of the island. If the car drives around the traffic circle until it is back to its original position, what is the circumference of the car's path?

Perimeter of a circle (distance around)

radius = 18

$C = \pi d$ $C = 2\pi r$

$C = (3.14)(36)$ $C = 2(3.14)(18)$

$C = 113.04$

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Example 4
Find Diameter and Radius

Find the diameter and radius of a circle to the nearest hundredth if the circumference of the circle is 77.8 centimeters.

$C = 2\pi r$ $C = \pi d$

$77.8 = 2(3.14)r$

$\frac{77.8}{6.28} = \frac{6.28r}{6.28}$

$12.38 = r$

$\frac{77.8}{3.14} = \frac{3.14d}{3.14}$

$24.76 = d$

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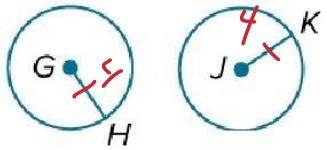
Learn
Pairs of Circles

As with other figures, pairs of circles can be congruent, similar, or share other special relationships.

Postulate 10.1

Words	Two circles are congruent if and only if they have congruent radii.
Example	 $\overline{GH} \cong \overline{JK}$, so $\odot G \cong \odot J$.

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Learn
Pairs of Circles

Theorem 10.1

Word	All circles are similar.
Example	 $\odot X \sim \odot Y$.

reduction

$\frac{\text{New}}{\text{Orig.}} \frac{3}{5} = 0.6$

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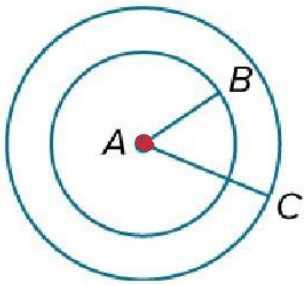
Learn

Pairs of Circles

Concentric circles are coplanar circles that have the same center.

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



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Example 5

Find Measures in Intersecting Circles

The diameter of ⊙*K* is 12 units, the diameter of ⊙*J* is 20 units, and *JD* = 8 units. Find *EK*.

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