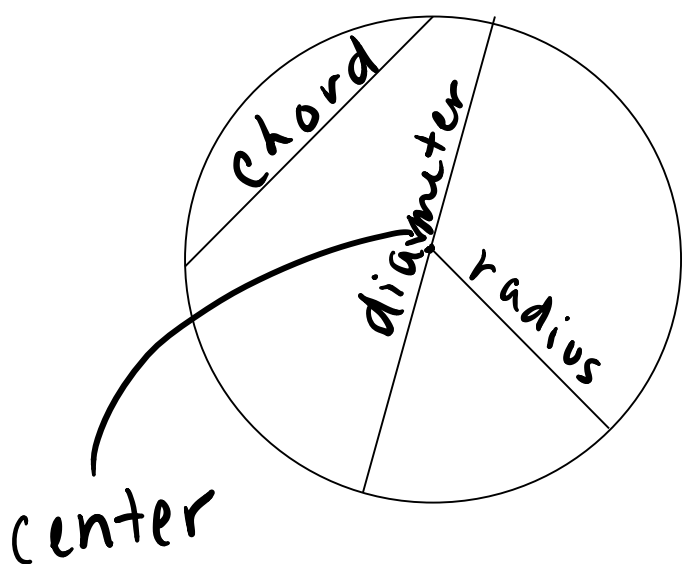


10.1/11.3 Circumference & Arc Length and Area of Circles & Sectors



Goals Aligned to Common Core State Standards:

- You will identify the center, chord, diameter, and radius of a circle.
- You will understand all circles as similar and derive the formula for the area of a sector.
- You will solve problems involving the radii, diameters, circumference, arc length and areas of circles and sectors.
- MP 1, 2, 6, 7, 8

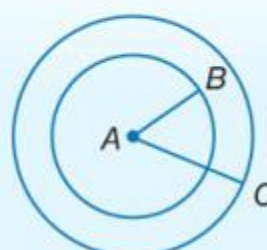
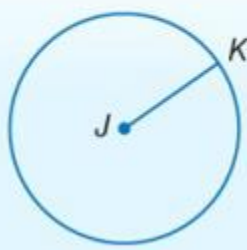
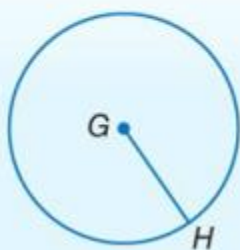
A circle is a set of points whose distance around a fixed point is constant.

Radius Formula $r = \frac{d}{2}$ or $r = \frac{1}{2}d$

Diameter Formula $d = 2r$

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

Concentric circles are coplanar circles that have the same center.



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

$A = \pi r^2$

<http://shmoop.com/video/circles/>

EX. 2 Find the circumference, diameter, or radius.

a.) Find C if $r = 7$ cm

$$2\pi 7 = 43.98 \text{ cm}$$

b.) Find C if $d = 12.5$ in

$$C = \pi(12.5)$$

$$C = 39.27$$

c.) $C = 136.9$ find D

$$\frac{136.9}{\pi} = \frac{\pi D}{\pi}$$
$$43.58 = D$$

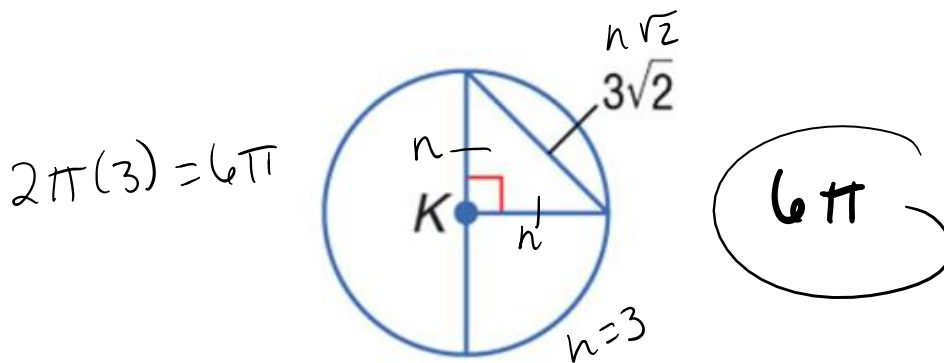
d.) Find r

$$\frac{43.58}{2} = 21.79$$

e.) Find the area

$$\pi(21.79)^2$$
$$1493.41 \text{ in}^2$$

Find the exact circumference of $\odot K$.



Find the exact area.

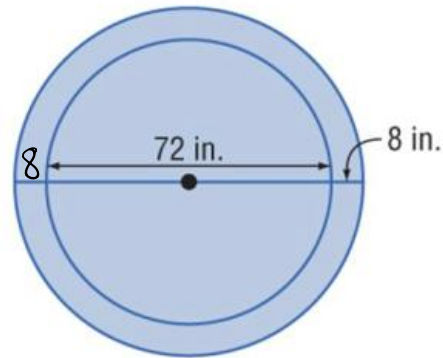
9π $\pi(3^2) = 9\pi$

MANUFACTURING An outdoor accessories company manufactures circular covers for outdoor umbrellas. If the cover is 8 inches longer than the umbrella on each side, find the area of the cover in square inches.

$$44^2 \pi$$

$$1936\pi$$

$$\frac{88}{2} = 44$$



ALGEBRA Find the radius of a circle with an area of 58 square inches.

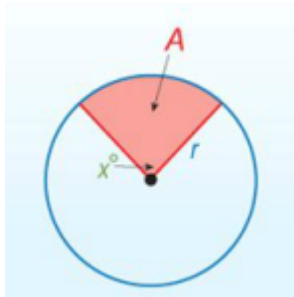
$$r = 4.3$$

$$\frac{58}{\pi} = \pi r^2$$

$$\sqrt{\frac{58}{\pi}} = \sqrt{r^2}$$

$$4.3 = r$$

Area of a sector:



PIE A pie has a diameter of 9 inches and is cut into 10 congruent slices. What is the area of one slice to the nearest hundredth?

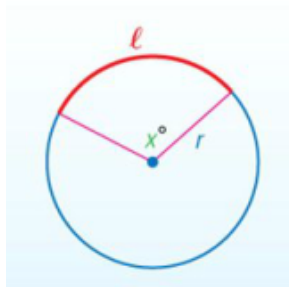
$$A = \frac{x}{360} \cdot \pi r^2$$

$$\frac{360}{10} = 36$$

$$\frac{36}{360} \cdot \pi (9)^2 = 25.45 \text{ in}^2$$

Arc Length Formula:

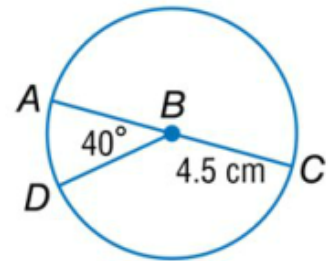
$$l = \frac{x}{360} \cdot 2\pi r$$



A. Find the length of \widehat{DA} . Round to the nearest hundredth.

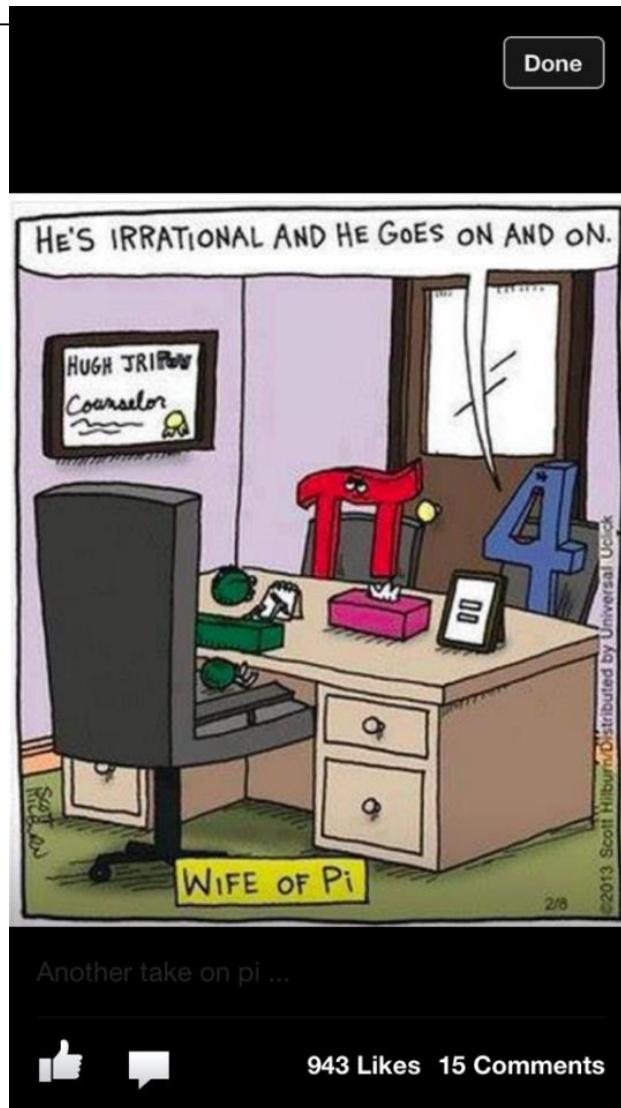
$$l = \frac{40}{360} \cdot 2 \cdot \pi \cdot 4.5$$

$$l = 3.14 \text{ cm}$$



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Another take on pi ...



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