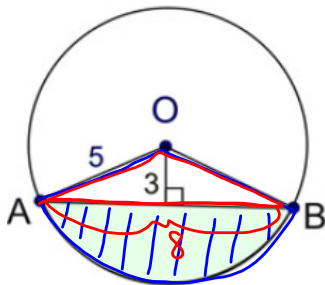


DO NOW

Find the shaded area in the diagram below. The radius of the circle is 5 in., the altitude of $\triangle AOB$ is 3 in., and $m\angle AOB$ is 106 degrees. Express the answer to the *nearest tenth* of a square inch.



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

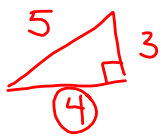
$$A = \frac{1}{2} bh$$

$$A = \frac{106}{360} \pi (5)^2$$

$$A = \frac{1}{2} (8)(3)$$

$$A = 23.1256\dots$$

$$A = 12$$



11.1

Feb 25-9:41 AM

The arc measure of the central angle of an entire circle is 360°

The radian measure of the central angle of an entire circle = 2π

$$360^\circ \text{ (degrees)} = 2\pi \text{ (radians)}$$

$$\frac{360^\circ}{360} = \frac{2\pi \text{ radians}}{2\pi}$$

$$\frac{360^\circ}{2\pi} = \frac{2\pi \text{ radians}}{2\pi}$$

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

$$\frac{180^\circ}{\pi} = 1 \text{ radian}$$

To change
from degrees to radians,
multiply degrees by $\frac{\pi}{180}$

To change
from radians to degrees,
multiply radians by $\frac{180}{\pi}$

Feb 28-6:56 AM

1. Convert 60° to radians.

$$60 \cdot \frac{\pi}{180} = \frac{\pi}{3} \text{ radians}$$

2. Convert 135° to radians.

$$135 \cdot \frac{\pi}{180} = \frac{3\pi}{4} \text{ radians}$$

3. Convert $\frac{\pi}{6}$ to degrees.

$$\frac{\cancel{\pi}}{6} \cdot \frac{180}{\cancel{\pi}} = 30^\circ$$

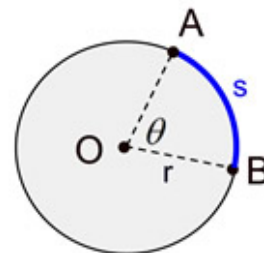
4. Convert to $\frac{5\pi}{2}$ degrees.

$$\frac{5\pi}{2} \cdot \frac{180}{\pi} = 450^\circ$$

Feb 28-6:56 AM

The radian measure, θ , of a central angle is defined as the ratio of the length of the arc the angle subtends, s , divided by the radius of the circle, r .

$$\theta = \frac{s}{r} = \frac{\text{length of subtended arc}}{\text{length of radius}}$$



which gives arc length, s : $s = \theta r$

Feb 25-9:44 AM

Arc Length

When θ is in degrees

$$s = \frac{\theta}{360} \cdot \pi d$$

degrees θ *circumference*
arc length πd *diameter*

When θ is in radians

$$\theta = \frac{s}{r}$$

radians θ *arc length*
radius r

Find the length of an arc subtended by an angle of $\frac{7\pi}{4}$ radians in a circle of radius 20 centimeters.

$$\theta = \frac{s}{r}$$

radians

$$20 \cdot \frac{7\pi}{4} = \frac{s}{20} \cdot 20$$

$$\boxed{35\pi = s}$$

$$\frac{7\pi}{4} \cdot \frac{180}{\pi} = 315^\circ$$

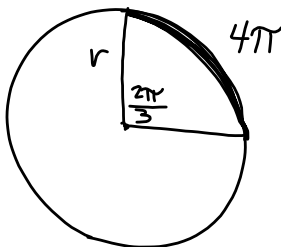
$$s = \frac{\theta}{360} \cdot \pi d$$

$$s = \frac{315}{360} \pi (40)$$

$$\boxed{s = 35\pi}$$

Feb 26-8:32 AM

A central angle whose measure is $\frac{2\pi}{3}$ radians intercepts an arc with a length of 4π feet. Find the radius of the circle, in feet.



$$\theta = \frac{s}{r}$$

$$\frac{2\pi}{3} = \frac{4\pi}{r}$$

$$\frac{2\pi r}{2\pi} = \frac{12\pi}{2\pi}$$

$$\boxed{r = 6}$$

Feb 26-8:41 AM