

Notes #16: Arc Lengths and Sector Areas (Section 11.6)

A. Proportion Review:

- reduce (top to bottom only; don't cross-reduce!)
- butterfly and solve for x
- your answers will be in terms of π

1.) $\frac{6}{12} = \frac{x}{3\pi}$

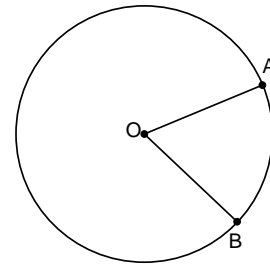
2.) $\frac{45}{360} = \frac{x}{9\pi}$

B. Vocabulary:

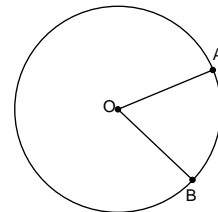
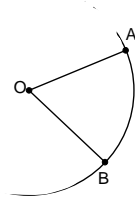
Central angle:

Arc length:

Sector area:



C. Circle Proportions: An arc length is part of the _____ and a sector area is part of the _____. Set up a proportion comparing the *part* of the circle to the *whole* circle.



Arc Length:

$$\frac{\text{central angle}}{360} = \frac{\text{arc length}}{2\pi r}$$

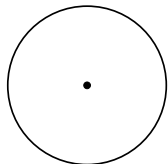
Sector Area:

$$\frac{\text{central angle}}{360} = \frac{\text{sector area}}{\pi r^2}$$

Sector AOB is described by giving $m\angle AOB$ and the radius of circle O. Make a sketch and find the length of \widehat{AB} and the area of sector AOB.

	3.	4.	5.	6.
$m\angle AOB$	30	45	108	40
radius	6	8	$4\sqrt{3}$	$\frac{5}{2}$

3.)



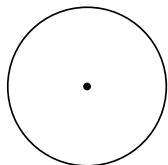
Arc Length

$$\frac{\text{central angle}}{360} = \frac{\text{arc length}}{2\pi r}$$

Sector Area

$$\frac{\text{central angle}}{360} = \frac{\text{sector area}}{\pi r^2}$$

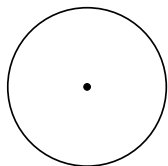
4.)



Arc Length

Sector Area

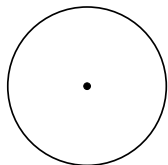
5.)



Arc Length

Sector Area

6.)

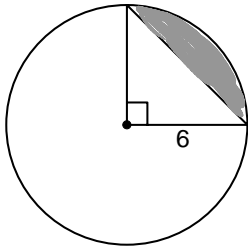


Arc Length

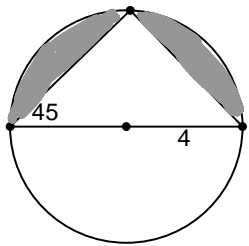
Sector Area

For #7-8, subtract areas to find the area of each shaded region.

7.)



8.)



9.) A 6 x 10m rectangular lawn is surrounded by a 3ft wide pathway on all sides. What is the area of the pathway only?

10.) A rectangle is 4 feet wider than it is long. If its area is 45ft^2 , find its perimeter.