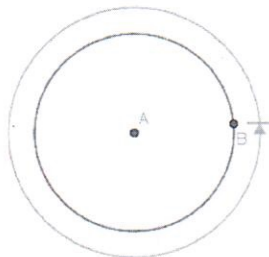


Objectives:

- Students will be able to calculate area, circumference, arc length, and area of a sector.

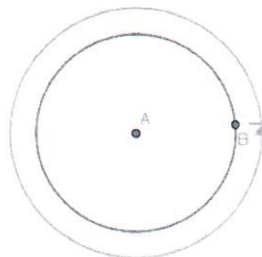
Vocabulary:

Area
 $A = \pi r^2$



$\pi = 3.14$
 $r = \text{radius}$

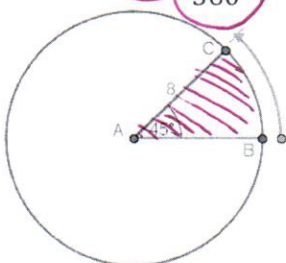
Circumference
 $C = 2\pi r$



$C = d\pi$
 $\frac{1}{2r}$

Area of a Sector

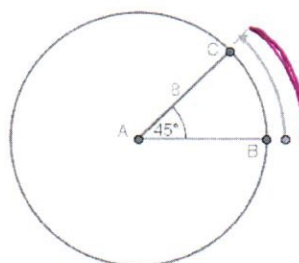
$A.S. = \pi r^2 \cdot \frac{\theta^\circ}{360^\circ}$
area *sector size*



$\theta = \text{angle}$

Arc Length

$A.L. = 2\pi r \cdot \frac{\theta^\circ}{360^\circ}$
circumference *sector size*

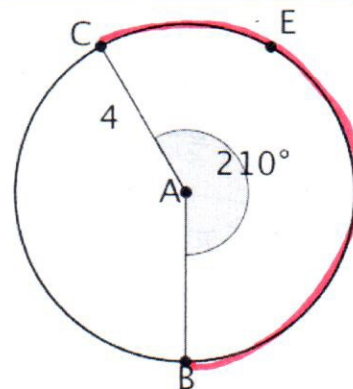


θ° is the measure of the central angle that intercepts the arc.

theta

Example Set: Find the following first in terms of π , then rounded to the nearest tenth.

- Area of $\odot A = \pi r^2$
 $= \pi(4)^2 = 16\pi \text{ units}^2$ OR 50.3 units^2
- Circumference of $\odot A = 2\pi r$ OR $2r\pi$
 $= 2(4)\pi = 8\pi \text{ units}$ OR 25.1 units
- Length of $\widehat{BEC} = 2\pi r \cdot \frac{\theta^\circ}{360^\circ}$
 $= (2)\pi(4) \left(\frac{210}{360} \right) = 4.7\pi$ OR 14.7 units
- Area of sector $BEC = \pi r^2 \cdot \frac{\theta}{360}$
 $= \pi(4)^2 \left(\frac{210}{360} \right) = 9.3\pi$ OR 29.3 units^2



\overline{AC} is a radius

Formulas

Area
 $A = \pi r^2$

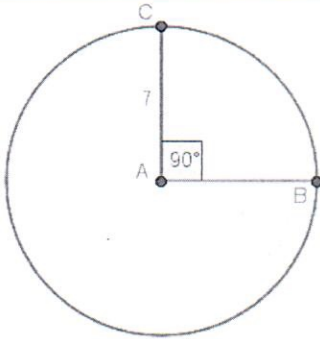
Arc Length
 $A.L. = 2\pi r \cdot \frac{\theta^\circ}{360^\circ}$

Circumference
 $C = 2\pi r$

Area of a Sector
 $A.S. = \pi r^2 \cdot \frac{\theta^\circ}{360^\circ}$

In Class Practice

Find the indicated arc length and the area of the sector in terms of π , then approximate answers to the nearest tenth.



1) Length of \widehat{BC} =

$$AL = 2\pi r \cdot \frac{\theta}{360}$$

$$= 2\pi(7) \left(\frac{90}{360}\right)$$

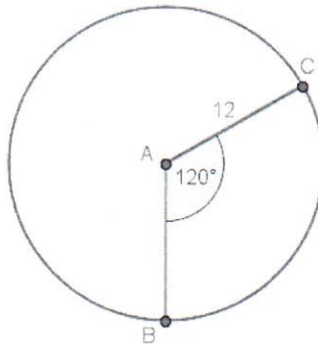
3.5π units OR 11.0 units

2) Area of sector BC =

$$AS = \pi r^2 \cdot \frac{\theta}{360}$$

$$= \pi(7)^2 \left(\frac{90}{360}\right)$$

12.25π OR 38.5 units²



3) Length of \widehat{CB} =

$$= 2\pi r \left(\frac{\theta}{360}\right)$$

$$= 2\pi(12) \left(\frac{120}{360}\right)$$

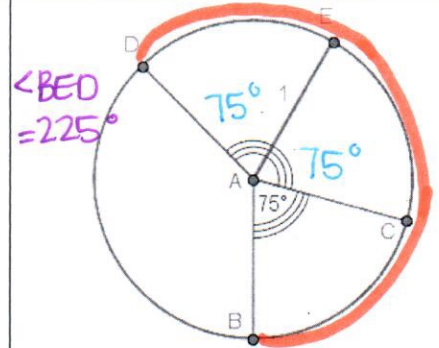
$$= 8\pi \text{ OR } 25.1 \text{ units}$$

4) Area of sector CB =

$$= \pi r^2 \left(\frac{\theta}{360}\right)$$

$$= \pi(12)^2 \left(\frac{120}{360}\right)$$

$$= 48\pi \text{ OR } 150.8 \text{ units}^2$$



5) Length of \widehat{BED} =

$$2\pi r \cdot \frac{\theta}{360}$$

$$= 2\pi(1) \left(\frac{225}{360}\right)$$

$$= 1.25\pi \text{ OR } 3.9 \text{ units}$$

6) Area of sector BED =

$$\pi r^2 \cdot \frac{\theta}{360}$$

$$\pi(1)^2 \left(\frac{225}{360}\right)$$

$$0.625\pi \text{ OR } 2.0 \text{ units}^2$$