Notes – Sector Area & Arc Length	**Name:** Key	
Standard:	**Hour:**	

Objective: I know how to calculate arc length and sector area.
Given arc length or sector area, I can find the radius, central angle, total area or circumference.

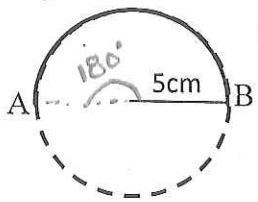
Review & Connect

Sectors and Arc Length

Circumference of a Circle

$$C = 2\pi r$$

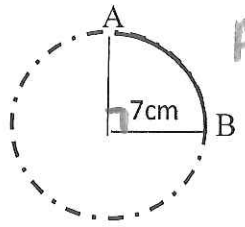
Find the length of arc AB.

1. 

$A_L = \frac{a}{360} \cdot 2\pi r$

$A_L = \frac{180}{360} \cdot 2\pi(5)$

$A_L = \frac{1800\pi}{360}$ → $5\pi\ cm^2$ / $15.7\ cm^2$

2. 

$A_L = \frac{a}{360} \cdot 2\pi r$

$A_L = \frac{90}{360} \cdot 2\pi \cdot 7$

$A_L = \frac{1260\pi}{360}$

$\frac{7}{2}\pi\ cm^2$ exact

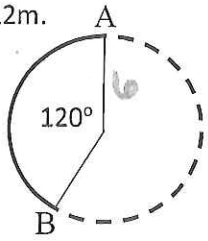
10.996 rounded

3. Diameter 12m.

$r = d \div 2$

$r = 12 \div 2$

$r = 6$



$A_L = \frac{120}{360} \cdot 2\pi \cdot 6$

$A_L = \frac{1440\pi}{360}$

$A_L = 4\pi\ m^2$ exact

$12.6\ m^2$

4. Complete the formula for arc length

$$L = \frac{a}{360} \cdot 2\pi r$$

5. Find the arc length of a 288° central angle and a radius of 15.

$A_L = \frac{288}{360} \cdot 2\pi 15$

$A_L = \frac{8640\pi}{360}$

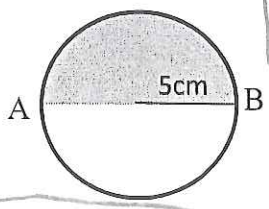
$A_L = 24\pi$ exact

$A_L = 75.4$ rounded

Area of a Circle

$$A = \pi r^2$$

Find the area of each sector (shaded region).

1. 

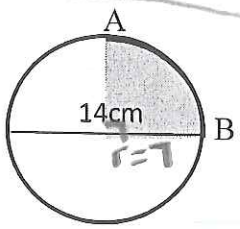
$A_S = \frac{a}{360} \cdot \pi r^2$

$= \frac{180}{360} \cdot \pi \cdot 5^2$

$= \frac{4500\pi}{360}$

$\frac{25}{2}\pi\ cm^2$

$39.3\ cm^2$

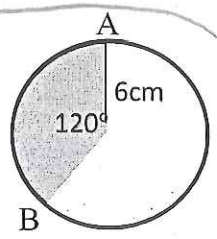
2. 

$A_S = \frac{90}{360} \cdot \pi 7^2$

$A_S = \frac{4410\pi}{360}$ exact

round

$A_S = \frac{49}{4}\pi\ cm^2$ | $38.5\ cm^2$

3. 

$A_S = \frac{120}{360} \cdot \pi 6^2$

$= \frac{4320\pi}{360}$ exact

round

$12\pi\ cm^2$ | $37.7\ cm^2$

4. Write a formula for sector area.

$$S = \frac{a}{360} \cdot \pi r^2$$

5. Find the area of a 288° sector with a radius of 15.

$A_S = \frac{a}{360} \cdot \pi r^2$

$A_S = \frac{288}{360} \cdot \pi \cdot 15^2$

$A_S = \frac{64800\pi}{360}$

$A_S = 180\pi$ | $A_S = 565.5$