Lesson # 34
Area of a Sector

In a circle, the ratio of the measures of two central angles is equal to the ratio of the areas of the two sectors formed.

Where have we seen this before???? Lesson.....

$$\frac{\text{Central Angle}}{360^\circ} = \frac{\text{Area of the Sector}}{\text{Area of the Circle}}$$

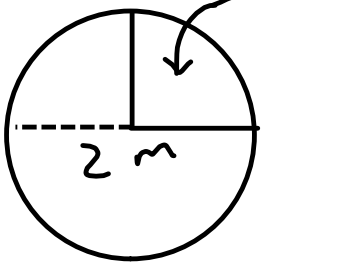
example 1: What is the area of a sector whose area is 50.24cm^2 and central angle is 120°.

$$\frac{CA}{360} = \frac{\text{Sector}}{A}$$

$$\frac{120}{360} \quad \frac{x}{50.24}$$

$$\frac{(120)(50.24)}{360} = 16.75\text{ cm}^2 \text{ (Area of Sector)}$$

example 2:



sector is $.785\text{cm}^2$

D = 2m = 200cm

Central angle ????

0.009°

$$\frac{CA}{360} = \frac{\text{Sector}}{A}$$

$$\frac{x}{360} = \frac{0.785}{\pi r^2} \quad \pi 100^2 = 31400$$

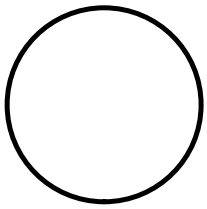
Or

d = 2cm

$$\frac{x}{360} = \frac{0.785}{\pi 1^2 = 3.14}$$

$x = 90^\circ$ ← This makes much more sense! :)

example 3: What is D and/or R?
Area of sector is 9.82 m^2
CA is 45°



$$\frac{CA}{360} = \frac{Sector}{A}$$

$$\frac{45}{360} = \frac{9.82}{A} \Rightarrow A = \frac{78.56}{3.14} = \frac{\pi r^2}{3.14}$$

$$\sqrt{25} = \sqrt{r^2}$$

$$5 = r \Rightarrow d = 10m$$

example 4: A circle has a radius of 21 cm.
Its central angle intercepts (goes with) an arc of 11cm.
What is the Area of the sector corresponding with this central angle?

① missing $\frac{CA}{360} = \frac{Sector}{A = \pi r^2 = \pi 21^2 = 1385.44}$

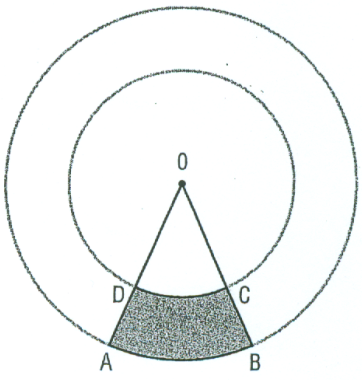
② $\frac{CA}{360} = \frac{Arc}{C = 2\pi r = 2\pi 21 = 131.95}$

$$\frac{x}{360} = \frac{11}{131.95} \Rightarrow CA = 30°$$

③ $\frac{30}{360} = \frac{Sector}{1385.44} \Rightarrow Sector = 115.45\,cm^2$

Team Names:_____

In the figure on the right, the area of the smaller disc is 452.16 cm^2, the circumference of the larger disc is 125.6 cm and the central angle A0B measures 40°.



a) Calculate the perimeter of the shaded region.

b) Calculate the area of the shaded region.

$A = \pi r^2$ $r = \sqrt{\frac{A}{\pi}}$ $d = \sqrt{\frac{A}{\pi}} \times 2$ $\frac{CA}{360} = \frac{\text{Sector}}{A}$

Name:_____ Date:_____

L. 33+34

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Circle Quiz ~ Lessons

1. Max and Kathryn build a scale model of a Roman amphitheatre as a project for their history class. The circular arena has a radius of 5.4 dm. Calculate its area.

1/2

area =_____

2. Sumo wrestlers perform on a circular mat with a diameter of 5 m. Find the area of the mat.

1/2

area =_____

3. Your father wants to make a circular skating rink in the back yard. If he wants the rink to have an area of approximately 50 m², what should its diameter be?

1/2

diameter =_____

4. Some people are sitting around a circular table with a radius of 26 dm. Find the area occupied by each person if it corresponds to a central angle of 70°.

1/2

area of sector =_____

5. In a television game show, one of the sectors of a "wheel of fortune" is formed by a central angle of 40°. The area of this sector is approximately 7 m². What is the radius of the wheel?

1/2

radius =_____