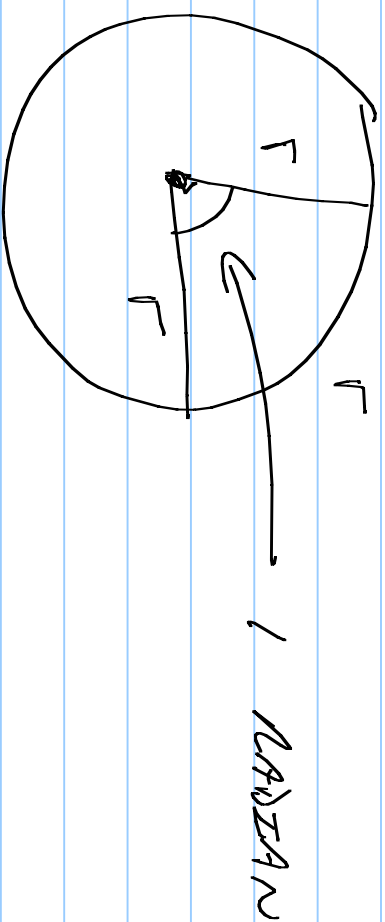


RADIAN MEASURE

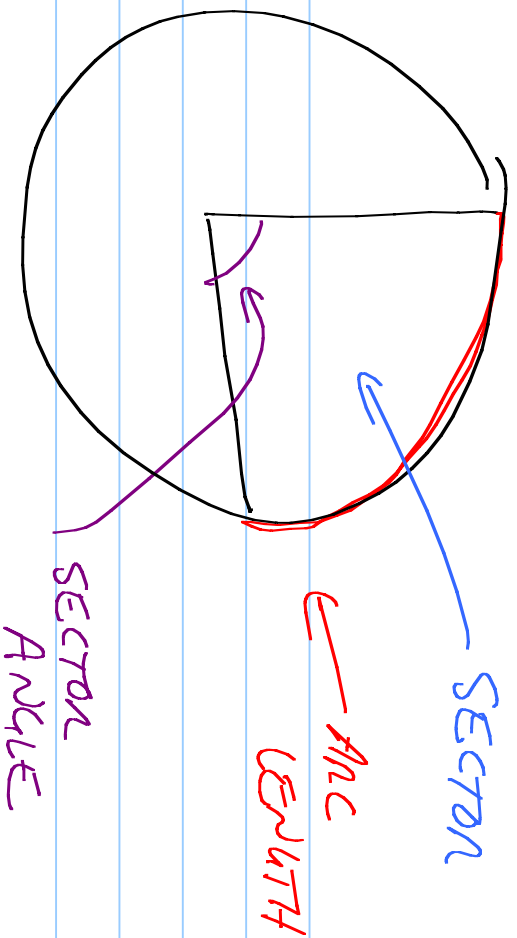
Note Title

10/18/2011

- ONE RADIAN IS THE MEASURE OF ANGLE SUBTENDED AT THE CENTRE OF A CIRCLE BY AN ARC EQUAL IN LENGTH TO THE RADIUS OF THE CIRCLE



NECALL:



— THE FOLLOWING RELATIONSHIP EXISTS

$$\frac{\text{ARC LENGTH}}{\text{CIRCUMFERENCE}} = \frac{\text{SECTOR ANGLE}}{\text{FULL TURN ANGLE}}$$

* CIRCUMFERENCE = $2\pi r$

* FULL TURN ANGLE = 360°

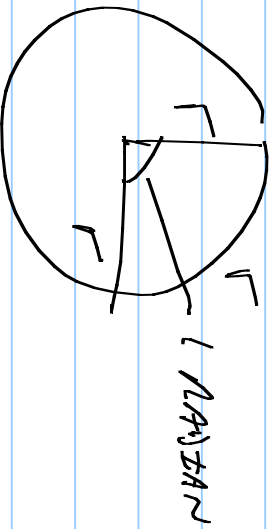
IS FIND THE ARC LENGTH IF RADIUS = 20 CM
AND SECTOR ANGLE = 140°

SOLN

$$\frac{\text{ARC LENGTH}}{2\pi(20)} = \frac{140}{360}$$

$$\text{ARC LENGTH} = 48.9 \text{ CM}$$

- How many degrees in one radian?



$$\frac{r}{2\pi r} = \frac{1 \text{ RADIAN}}{360}$$

$$\frac{360^\circ}{2\pi} = 1 \text{ RADIAN}$$

$$57.3^\circ = 1 \text{ RADIAN}$$

IS EXPRESS EACH ANGLE TO 2 DECIMAL PLACES

A) 4 RADIAN TO DEGREES

B) 138° IN RADIAN

$$\frac{360}{2\pi} = \frac{180}{\pi}$$

Solve A) 1 RADIAN $= \frac{180}{\pi}$

$$4 \text{ RADIAN} = 4 \left(\frac{180}{\pi} \right) = 229.18^\circ$$

B) $\frac{180^\circ}{180^\circ} = \pi \text{ RADIAN}$

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

$$138^{\circ} = \left(\frac{\pi \text{ RADIANS}}{180} \right) \times 138 \\ = 2.41 \text{ RADIANS}$$

* DEGREES \Rightarrow RADIANS

$$\text{DEGREES} \times \frac{\pi}{180}$$

* RADIANS \Rightarrow DEGREES

$$\text{RADIANS} \times \frac{180}{\pi}$$

— THE ARC LENGTH "a" SUBTENDED BY AN ANGLE

⊖ RADIANS IN A CIRCLE WITH RADIUS r

IS GIVEN BY THE FORMULA $a = r \theta$

THE CIRCLE WITH RADIUS 6.5 cm, FIND THE ARC LENGTH OF EACH ANGLE

A) 2.3 RADIANS B) 75°

Solve A) $a = r \theta$ B) $75 \times \frac{\pi}{180} = 1.31$

$$a = 6.5 \times 2.3$$

$$a = 6.5 \times 1.31$$

$$a = 14.95 \text{ cm}$$

$$a = 8.51 \text{ cm}$$

$$75 \times \frac{11}{140} = \frac{75 \cdot 11}{140} = \frac{517}{12}$$

H/W Pg 167 [# 1, 4, 6, 7, 8, 10, 11 ACE for ALL]

13, ^{ALL} 14 AC

15 Honours