

ACTIVITY - 4

Subject	MATHEMATICS
Class	XI
Chapter/Unit	Trigonometric functions
Topic	Degree and radian measure of angle
Time	40 min
Nature of Activity	Individual

What will I learn (Learning Outcome)?

To verify the relation between the degree measure and the radian measure of an angle.

Skills: Logical ability, Analytical thinking, Deductive reasoning, Creativity, Accuracy.

What I have to do?

Find a relation between degree measure and radians

What do I require?

Bangle, geometry box, protractor, thread, marker, cardboard, white paper.

What do I need to know?

Angles and its Degree measure

➤ Teacher's Activity

Teacher will explain the concept of Degree and Radian

1. Let the radius of the circle be r and l be an arc subtending an angle θ at the centre C, as shown in Fig.4.2 $\theta = \frac{l}{r}$ radians.

2. If Degree measure of $\theta = \frac{l}{2\pi r} \times 360$ degrees

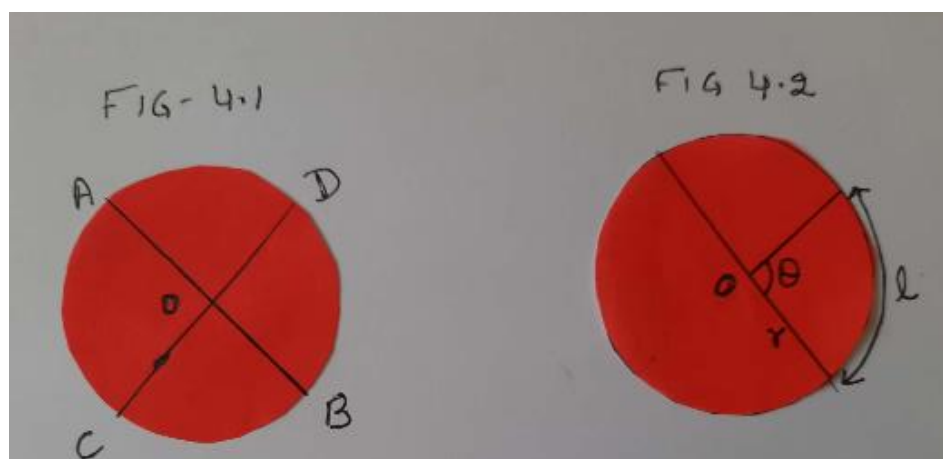
$$\text{then } \frac{l}{r} \text{ radians} = \frac{l}{2\pi r} \times 360 \text{ degrees}$$

$$\text{or } 1 \text{ radian} = \frac{180}{\pi} \text{ degrees}$$
$$= 57.27 \text{ degrees}$$

How will I proceed?

➤ Student's Activity

1. Take a cardboard and paste a white paper on it.
2. Draw a circle with centre O (Fig. 4.1). Let AB and CD be two diameters intersecting at O. The point O is the centre of the circle
3. Thus $OA = OB = OC = OD = \text{radius}$.
4. Measure arc lengths CA, AD, CB, BD using thread and record them



What have I observed?

<u>S. No</u>				
	Arc	length of arc (l)	radius of circle (r)	Radian measure
<u>1.</u>	$\widehat{CA}$	-----	-----	$\angle COA = \frac{\widehat{CA}}{r} = \underline{\hspace{2cm}}$
<u>2.</u>	$\widehat{AD}$	-----	-----	$\angle AOD = \frac{\widehat{AD}}{r} = \underline{\hspace{2cm}}$
<u>3.</u>	$\widehat{BD}$	-----	-----	$\angle BOD = \frac{\widehat{BD}}{r} = \underline{\hspace{2cm}}$
<u>4.</u>	$\widehat{CB}$	-----	-----	$\angle COB = \frac{\widehat{CB}}{r} = \underline{\hspace{2cm}}$

Use protractor, measure the angle in degrees and complete the table.

Angle	Degree measure	Radian Measure	Ratio = $\frac{\text{Degree measure}}{\text{Radian measure}}$
$\angle COA$	-----	-----	-----
$\angle AOD$	-----	-----	-----
$\angle BOD$	-----	-----	-----
$\angle COB$	-----	-----	-----

What have I learnt?

The value of one radian is equal to _____ degrees.

What am I curious to learn?

Apply this in study of trigonometric functions.

Let me evaluate myself

Q1. A circular wire of radius 3 cm is cut and bent so as to lie along the circumference of a hoop whose radius is 48 cm. Find the angle in degrees which is subtended at the centre of hoop.

Q2. Write the radian measure of $5^\circ 37' 30''$.

Q3 Write the degree measure of $\frac{11}{16}$ radian.

Q4. Write the value of $\tan \frac{19\pi}{3}$

Q5. What is the value of $\sin (-1125^\circ)$.
