MATHEMATICS PROJECT

CLASS: 10

TOPIC: TO PREPARE TRIGONOMETRIC CHART FOR sin, cos and tan FUNCTIONS OF ANY ANGLE
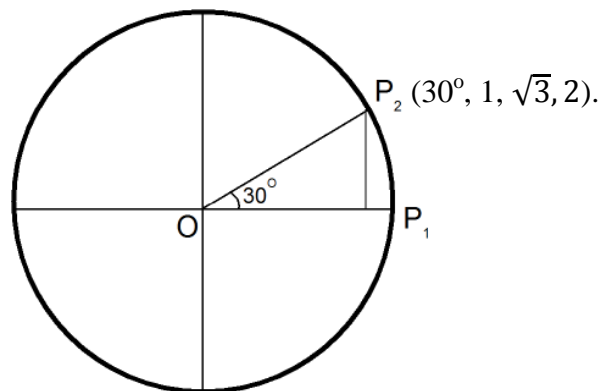
OBJECTIVE: To express the trigonometric position of a point and determine the sin, cos and tan functions of this position of the point.

MATERIALS REQUIRED:

1. Compass box
2. Practical workbook
3. Thread
4. Scale
5. Sketch pen
6. 2 mm graph papers

PROCEDURE:

1. Draw a circle of 2 cm radius on the 2 mm graph paper.
2. With O as the centre, draw $\angle P_1 O P_2 = 30^o$ with the help of pencil, compass and ruler.
3. There are two system of co-ordinates to express the position of a point. They are known as polar co-ordinate and Cartesian co-ordinates. The trigonometric co-ordinates are expressed by combining both the systems and written in the order as (θ, Y, X, R).
4. Drop a perpendicular $P_2 M'$ on OP_1.
5. Measure $P_2 M'$ and OP_2.
6. You will find $P_2 M' = 1\ cm\ and\ OP_2 = 2\ cm.$ Use Pythagoras' theorem to calculate $OM' = \sqrt{3}$ cm.
7. Plot the co-ordinates of P_2 as $(30^o, 1, \sqrt{3}, 2)$.
8. Similarly repeat the steps from 1 to 5 for $\angle P_1 O P_3 = 45^o, \angle P_1 O P_4 = 60^o, \angle P_1 O P_5 = 90^o$ and plot the co-ordinates of P_3, P_4, P_5.
9. For each of these angles drawn and co-ordinates plotted draw a separate circle to illustrate.
10. Diagram should be neat and clearly labeled.

RESULT:

Trigonometric values for different angles making use of the co-ordinates are determined and tabulated.

Trigonometric co-ordinates points	Angle (θ)	Perpendicular (P) Y	Base (B) X	Hypotenuse (H) (also radius R)	$\sin\theta = \dfrac{P}{H}$	$\cos\theta = \dfrac{B}{H}$	$\tan\theta = \dfrac{P}{B}$
P_1	0°						
P_2	30°	1	$\sqrt{3}$	2			
P_3	45°						
P_4	60°						
P_5	90°						

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