

$$\begin{aligned}
 \underline{5.} \quad \sin^8 \theta - \cos^8 \theta &= (\sin^4 \theta - \cos^4 \theta)(\sin^4 \theta + \cos^4 \theta) \\
 &= (\sin^2 \theta - \cos^2 \theta)((\sin^2 \theta + \cos^2 \theta)^2 - 2\sin^2 \theta \cos^2 \theta) \\
 &= (\sin^2 \theta - \cos^2 \theta)(1 - 2\sin^2 \theta \cos^2 \theta)
 \end{aligned}$$

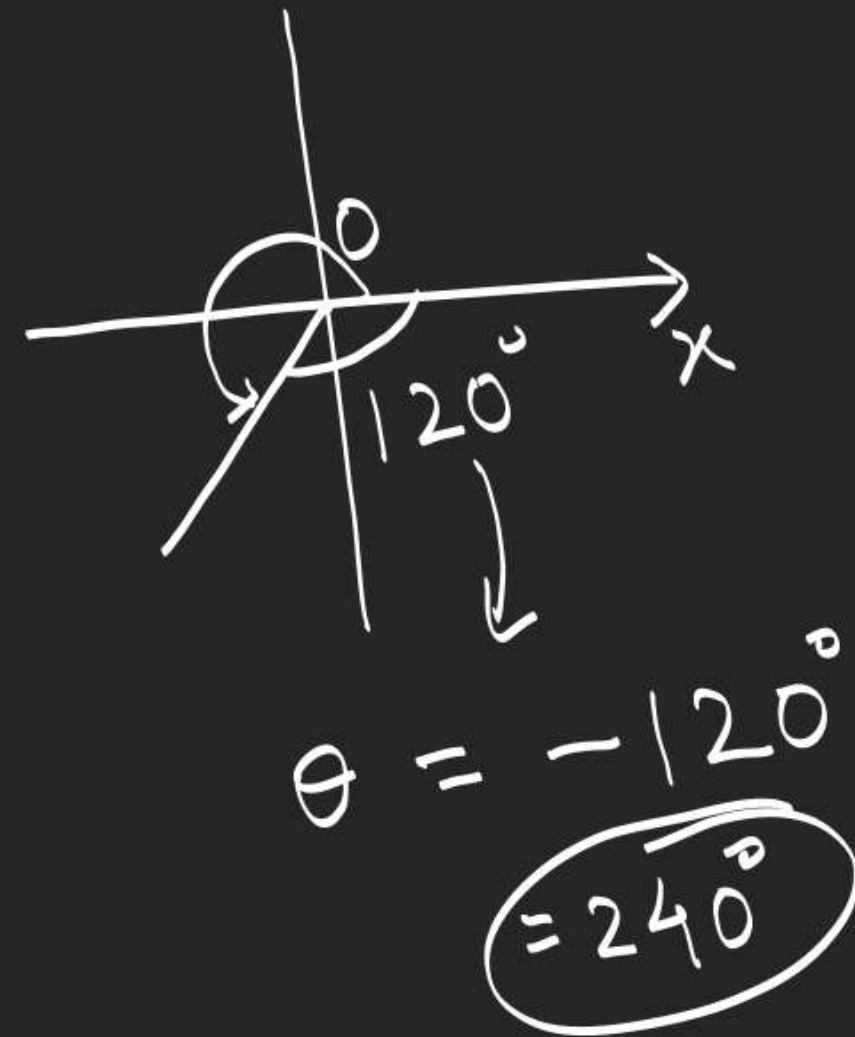
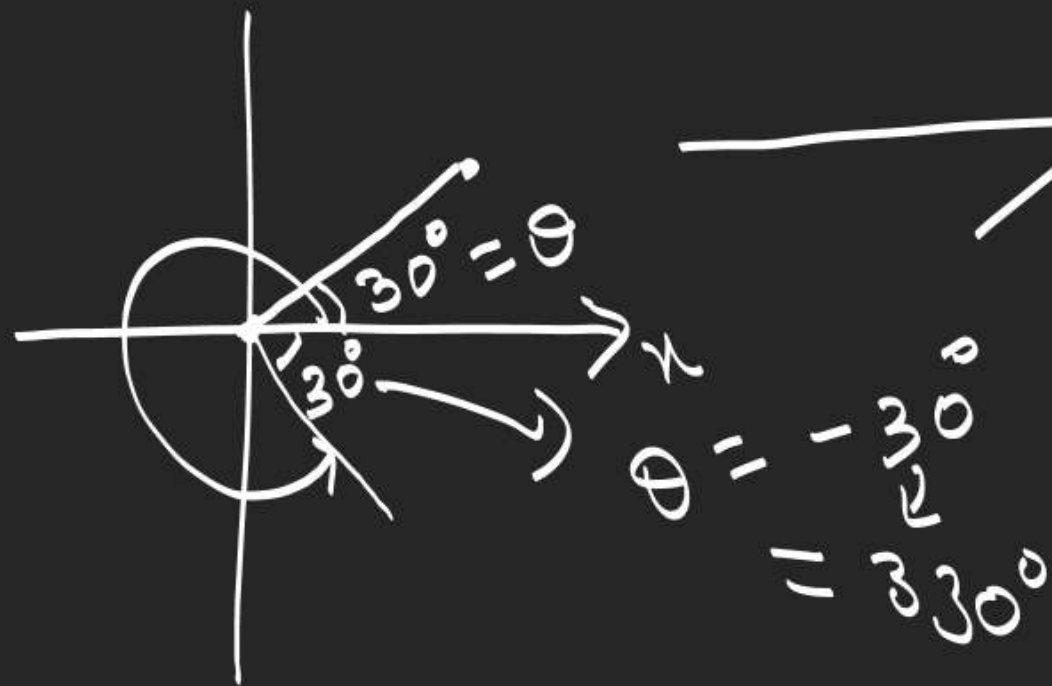
$$\begin{aligned}
 \underline{4.} \quad \sin^6 A + \cos^6 A &= (\sin^2 A + \cos^2 A)^3 - 3\sin^2 A \cos^2 A (\sin^2 A + \cos^2 A) \\
 &= 1 - 3\sin^2 A \cos^2 A \\
 \underline{3.} \quad \frac{\sin A}{1 + \cos A} + \frac{1}{\sin A} &= \frac{\sin A + (1 + \cos A)^2}{\sin A (1 + \cos A)}
 \end{aligned}$$

$$2 \operatorname{cosec} A = \frac{2(1 + \cos A)}{\sin A (1 + \cos A)} = \frac{\sin^2 A + \cos^2 A + 1 + 2 \cos A}{\sin A (1 + \cos A)}$$

Measurement of Angle

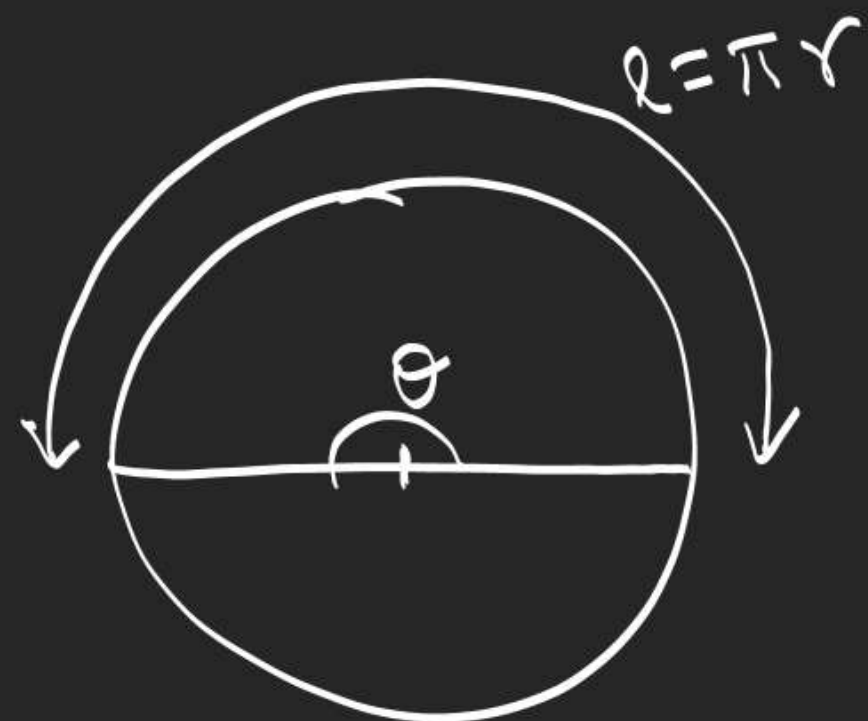
Degrees

Radian



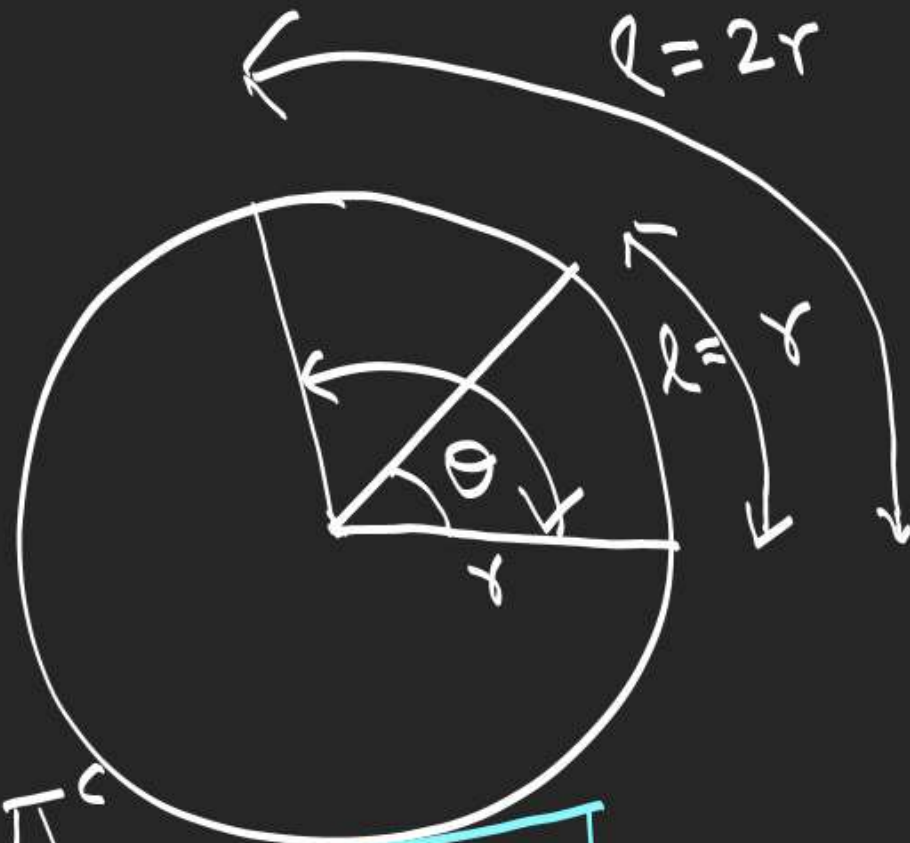
Radian

1 radian or 1^c or 1 is



$$l = \pi r, \theta = \pi^c$$

$$\pi^c = 180^\circ$$



$$\theta = 1^c$$

$$\text{if } l = r$$

$$\theta = 2^c$$

$$\text{if } l = 2r$$

$$\theta = 3^c$$

$$\text{if } l = 3r$$

$$\therefore \theta = k^c$$

$$\text{if } l = kr$$

$$1^c$$

$$\pi^c = 180^\circ$$

$$1^c = \left(\frac{180}{\pi} \right)^\circ \approx (57. \dots)^\circ$$

$$36^\circ = \frac{\pi}{5}$$

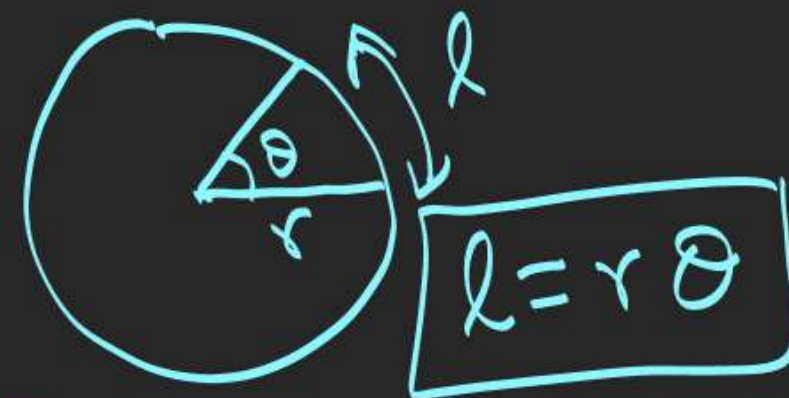
$$\pi^c = 180^\circ$$

$$1^\circ = \left(\frac{\pi}{180} \right)^c$$

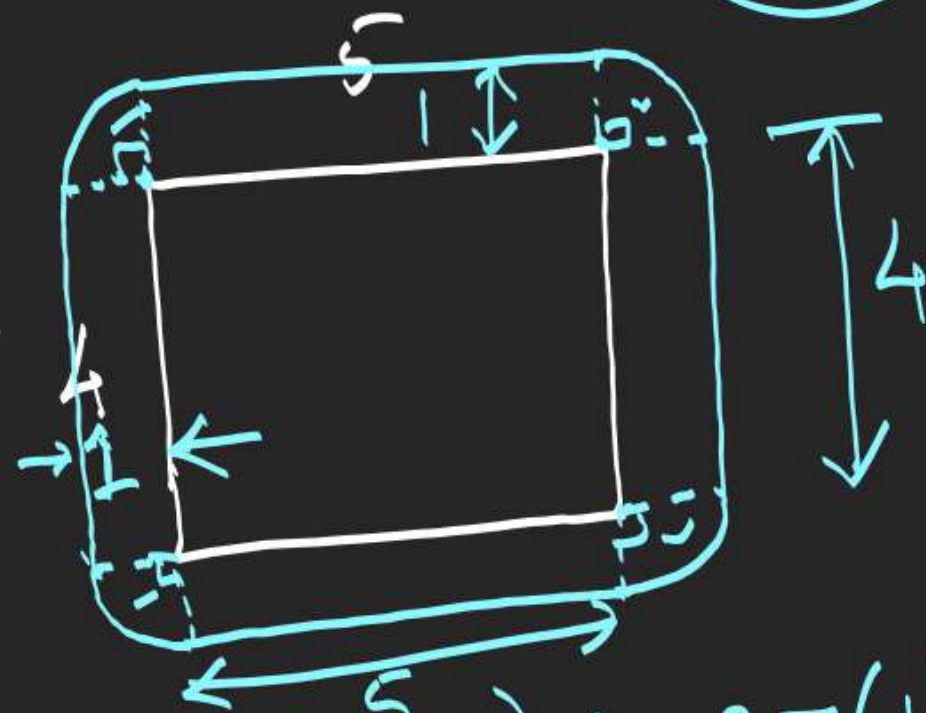
$$\frac{5\pi}{12} = \left(\frac{5 \times 180}{12} \right)^\circ = 75^\circ$$

$$36^\circ = \left(\frac{\pi}{180} \times 36 \right)^c$$

$$120^\circ = \frac{\pi}{180} \times 120 = \frac{2\pi}{3}$$



Distance covered by moving outside the rectangle always at a distance of 1 unit from its sides by doing 1 revolution



$$2(4+5) + 2\pi(1)$$

$$2\pi + 18$$

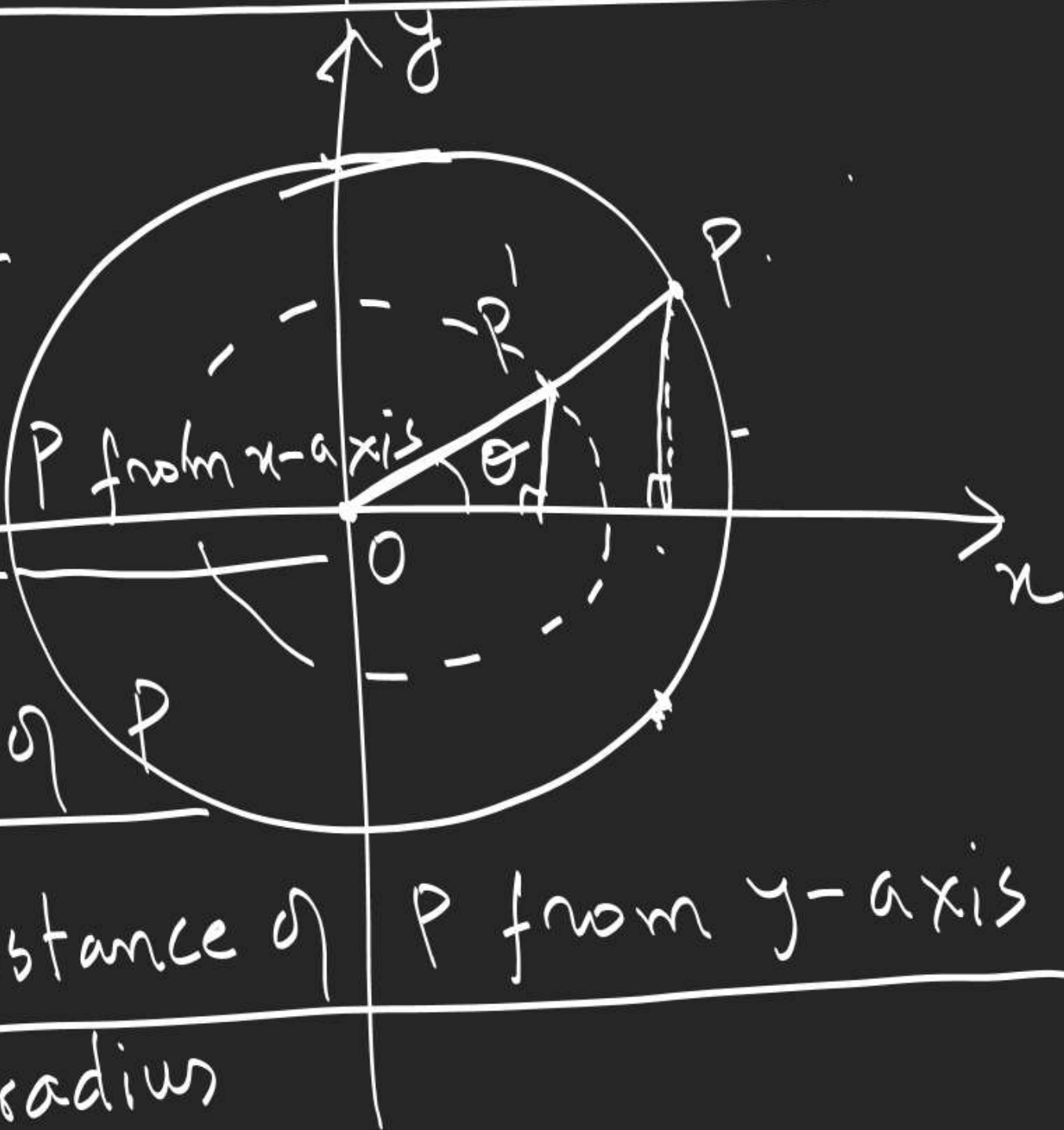
Definition of $\sin \theta$ & $\cos \theta$

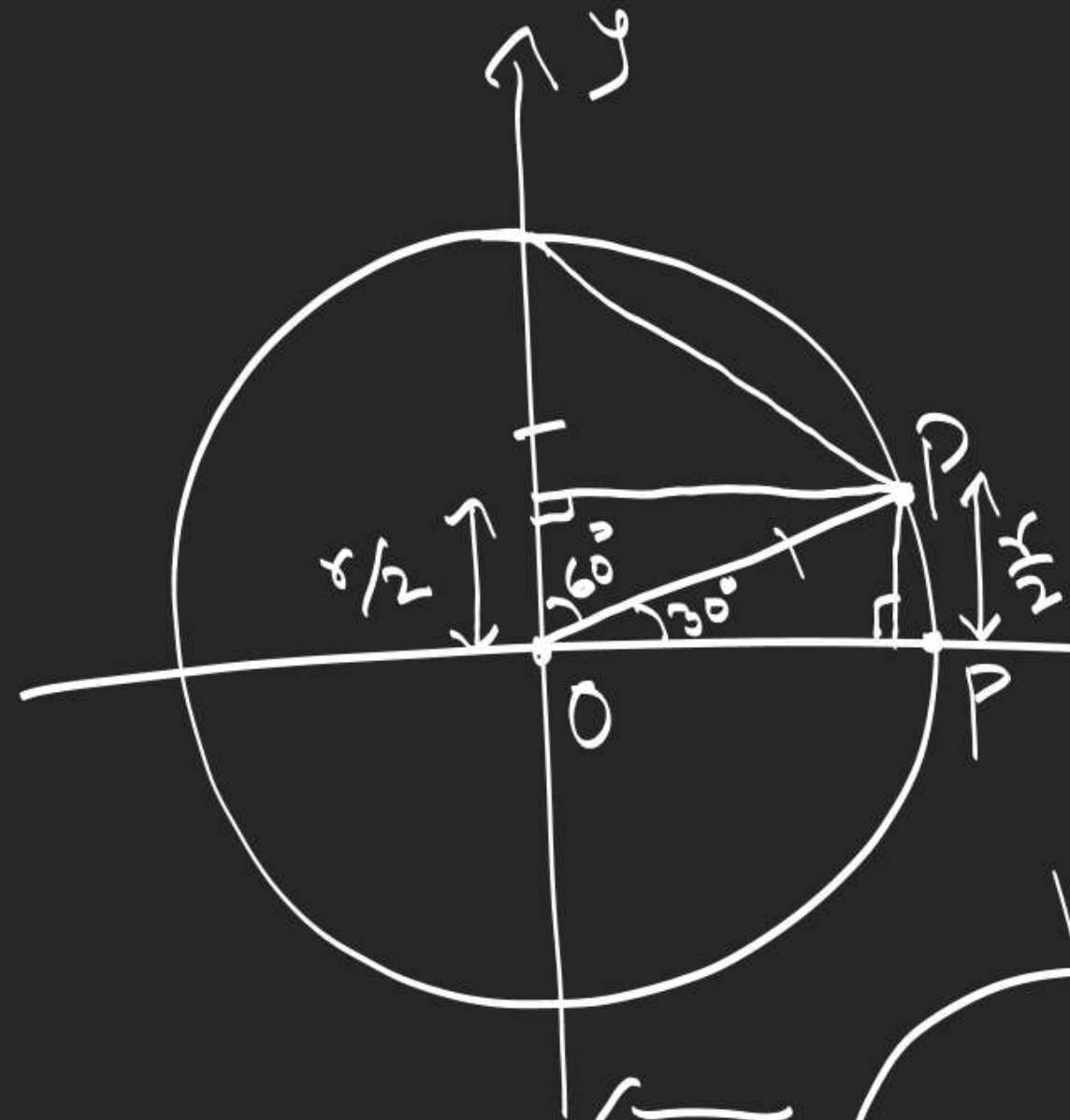
$$\sin \theta = \frac{\text{y coordinate of } P}{\text{radius}}$$

$$= \frac{\text{algebraic distance of } P \text{ from x-axis}}{\text{radius}}$$

$$\cos \theta = \frac{\text{x-coordinate of } P}{\text{radius}}$$

$$= \frac{\text{algebraic distance of } P \text{ from y-axis}}{\text{radius}}$$



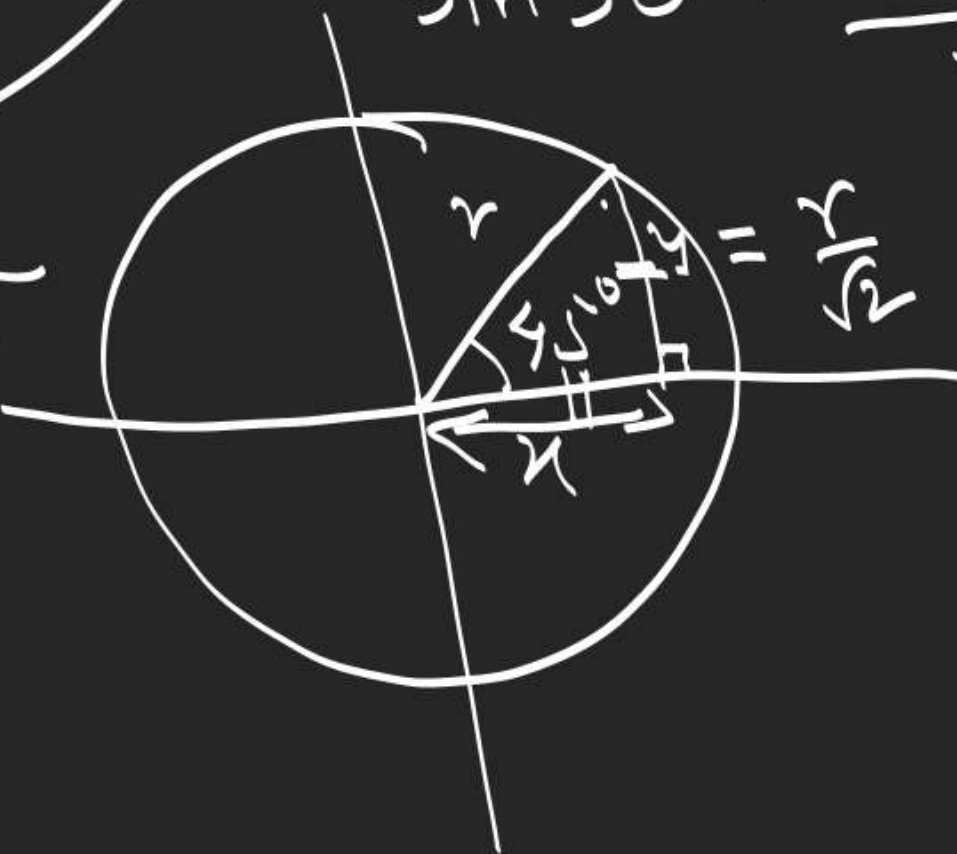


$$\sin 0^\circ = \frac{0}{r} = 0$$

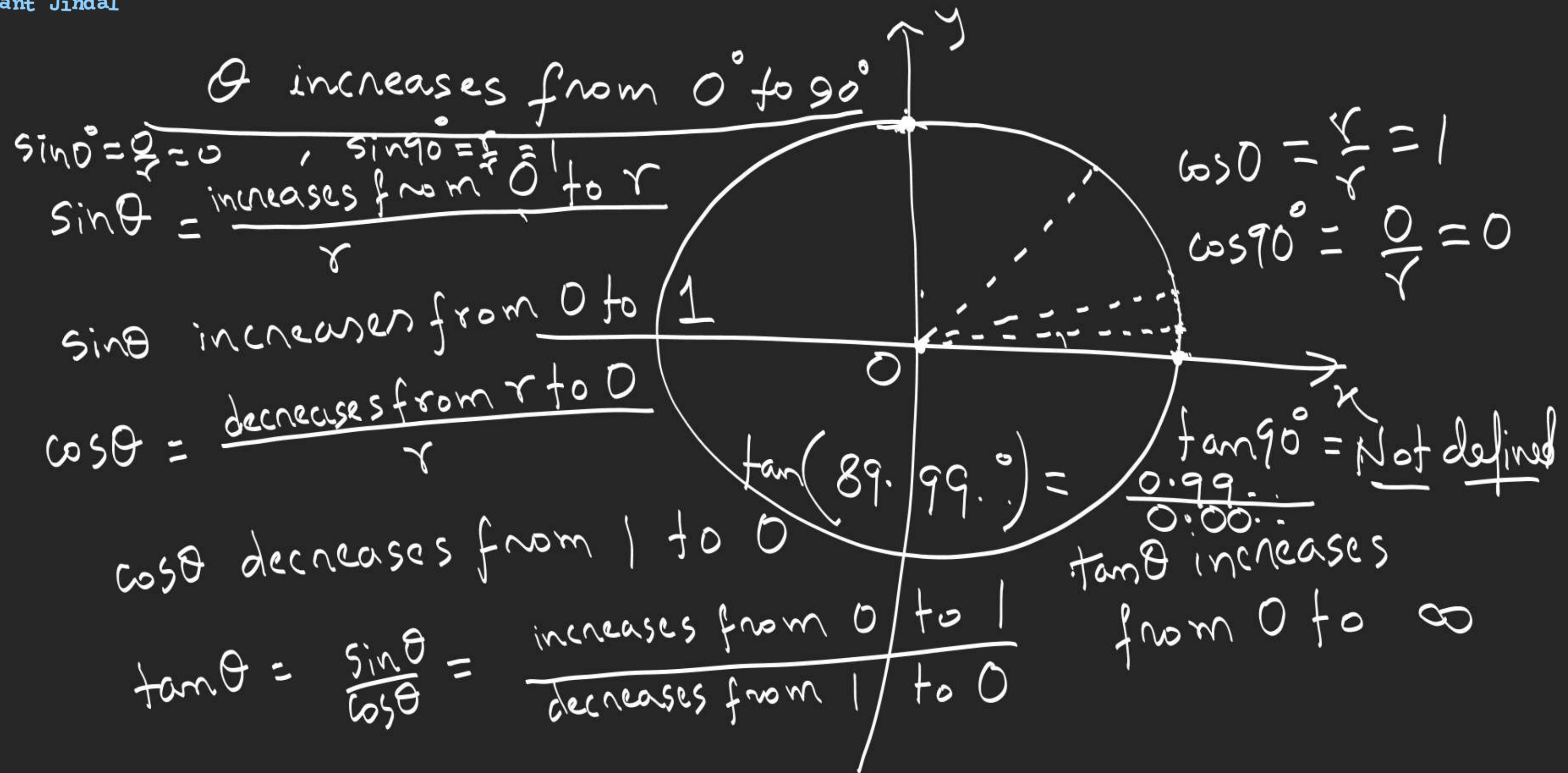
$$\cos 0^\circ = \frac{r}{r} = 1$$

$$\sin 30^\circ = \frac{r/2}{r} = \frac{1}{2}$$

$$r^2 = x^2 + y^2 = r^2$$



$$\sin 45^\circ = \frac{r/2}{r}$$



θ increases from 0° to 90°

$\sin \theta$ increases from 0 to 1

$\cos \theta$ decreases from 1 to 0

$\tan \theta$ increases from 0 to ∞

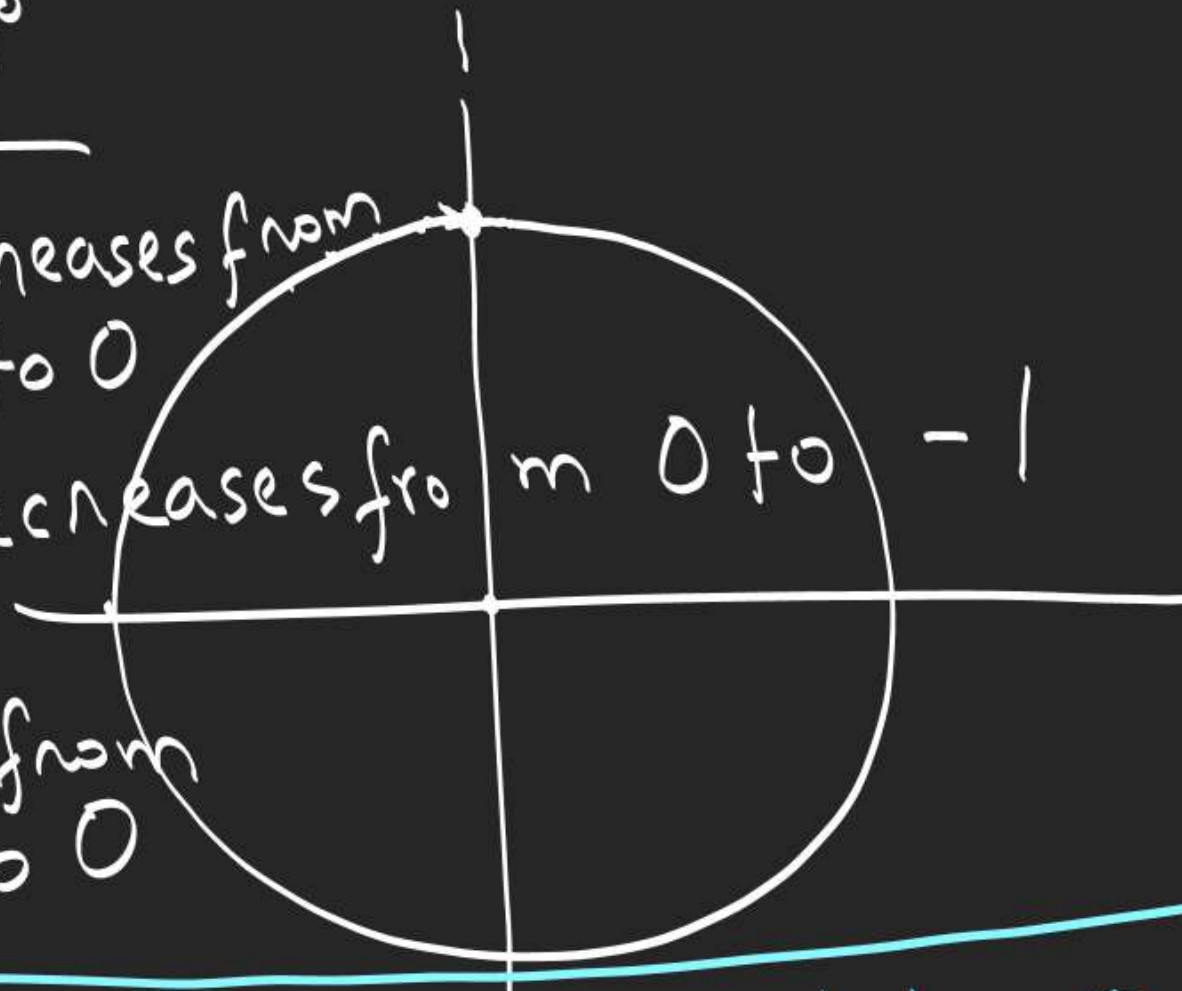
θ increases from 90° to 180°

$$\sin \theta = \frac{\text{decreases from } r \text{ to } 0}{r} = \text{decreases from } 1 \text{ to } 0$$

$$\cos \theta = - \frac{0 \text{ to } r}{r} = \text{decreases from } 0 \text{ to } -1$$

$$\tan \theta = \frac{1 \text{ to } 0}{0 \text{ to } -1} = \text{increases from } -\infty \text{ to } 0$$

$\tan 90.000\dots$



$\sin \theta$ decreases from 1 to 0
 $\cos \theta$ decreases from 0 to -1
 $\tan \theta$ increases from $-\infty$ to 0

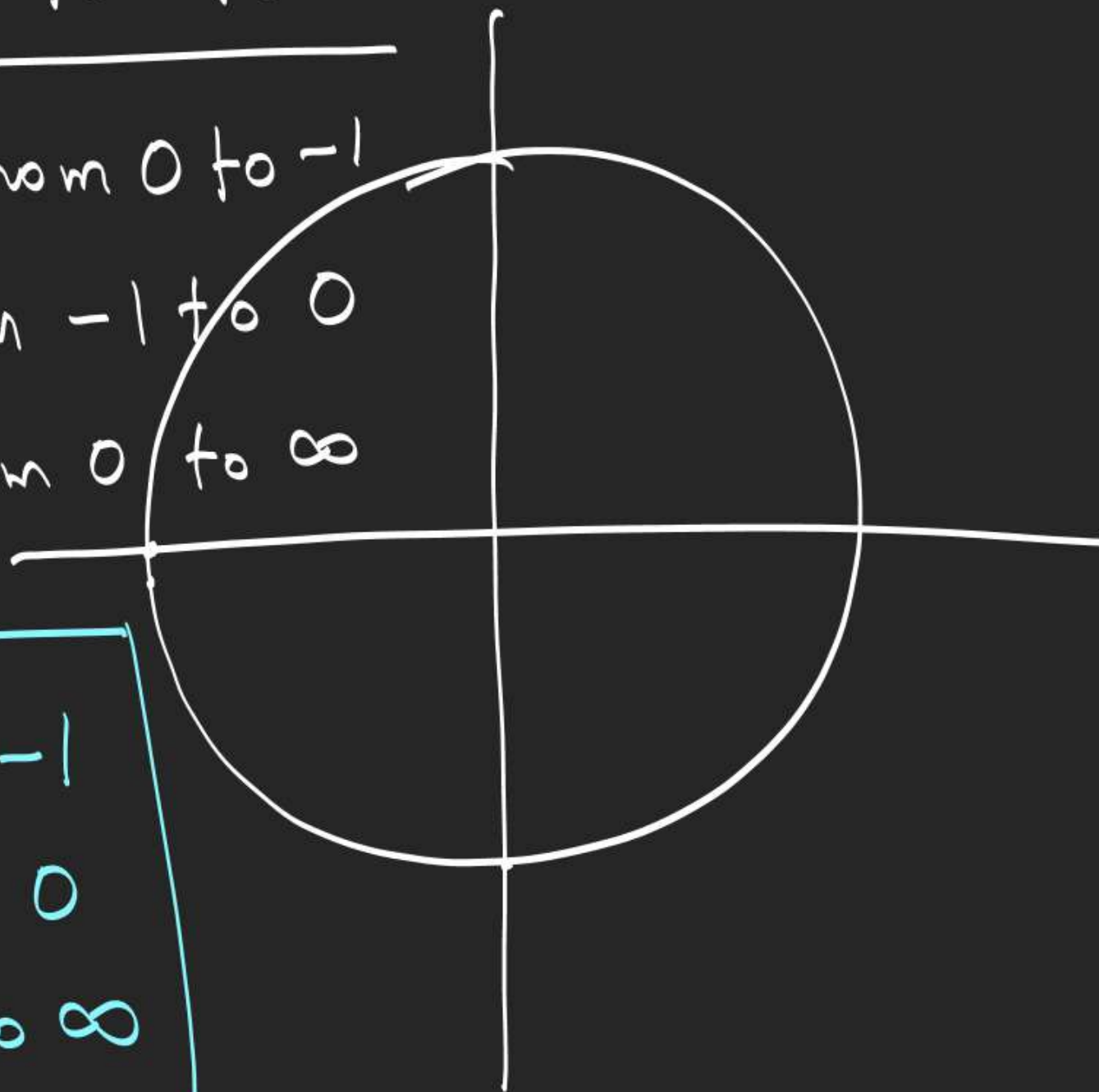
θ increases from 180° to 270°

$$\sin \theta = -\frac{0 \text{ to } r}{r} = \text{decreases from } 0 \text{ to } -1$$

$$\cos \theta = -\frac{r \text{ to } 0}{r} = \text{increases from } -1 \text{ to } 0$$

$$\tan \theta = \frac{0 \text{ to } 1}{1 \text{ to } 0} = \text{increases from } 0 \text{ to } \infty$$

$\sin \theta$ decreases from 0 to -1
 $\cos \theta$ increases from -1 to 0
 $\tan \theta$ increases from 0 to ∞

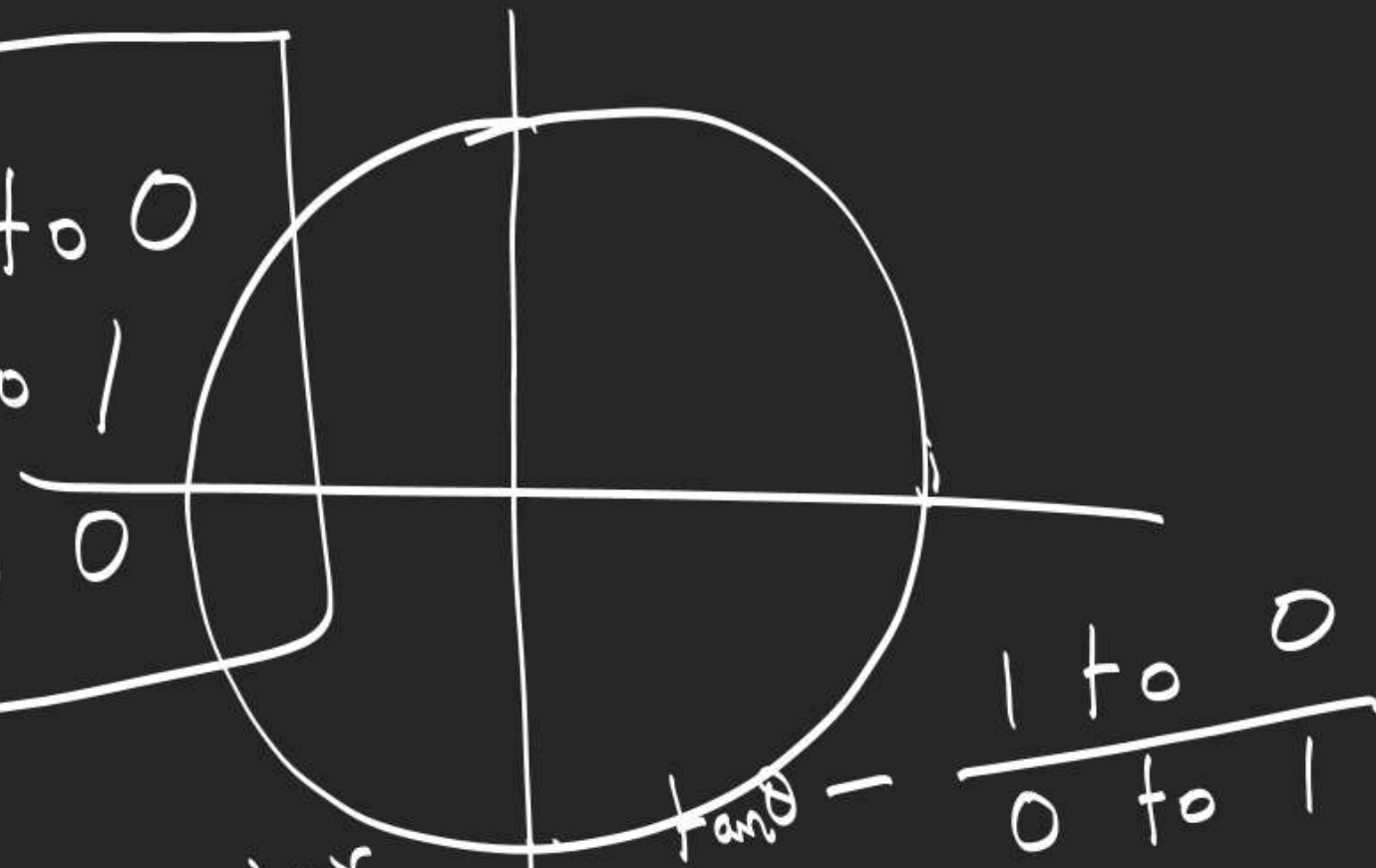


θ increases from 270° to 360°

$\sin \theta$ increases from -1 to 0

$\cos \theta$ increases from 0 to 1

$\tan \theta$ increases from $-\infty$ to 0



$$361^\circ = 360^\circ + 1^\circ$$

$$729^\circ = 2 \times 360^\circ + 9^\circ$$

$$\cos \theta = \frac{x}{r}$$

$$\sin \theta = \frac{y}{r}$$

$$\tan \theta = \frac{y}{x}$$