YAKEEN NEET 2.0

2026

Basic Maths and Calculus (Mathematical Tools)

PHYSICS

Lecture - 03

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Trigonometry and calculation

* If θ is very small

$$\sin\theta \approx \theta \approx \tan\theta$$

$$\cos\theta \approx \sqrt{1-\theta^2}$$

$$\cos\theta = \sqrt{1-\sin^2\theta}$$

① $\cos 2^\circ \approx \sqrt{1-\left(\frac{2\pi}{180}\right)^2} = \sqrt{1-\frac{\pi^2}{8100}}$

② $\cos 3^\circ \longrightarrow 1$

④ $\cos 4^\circ \longrightarrow 1$

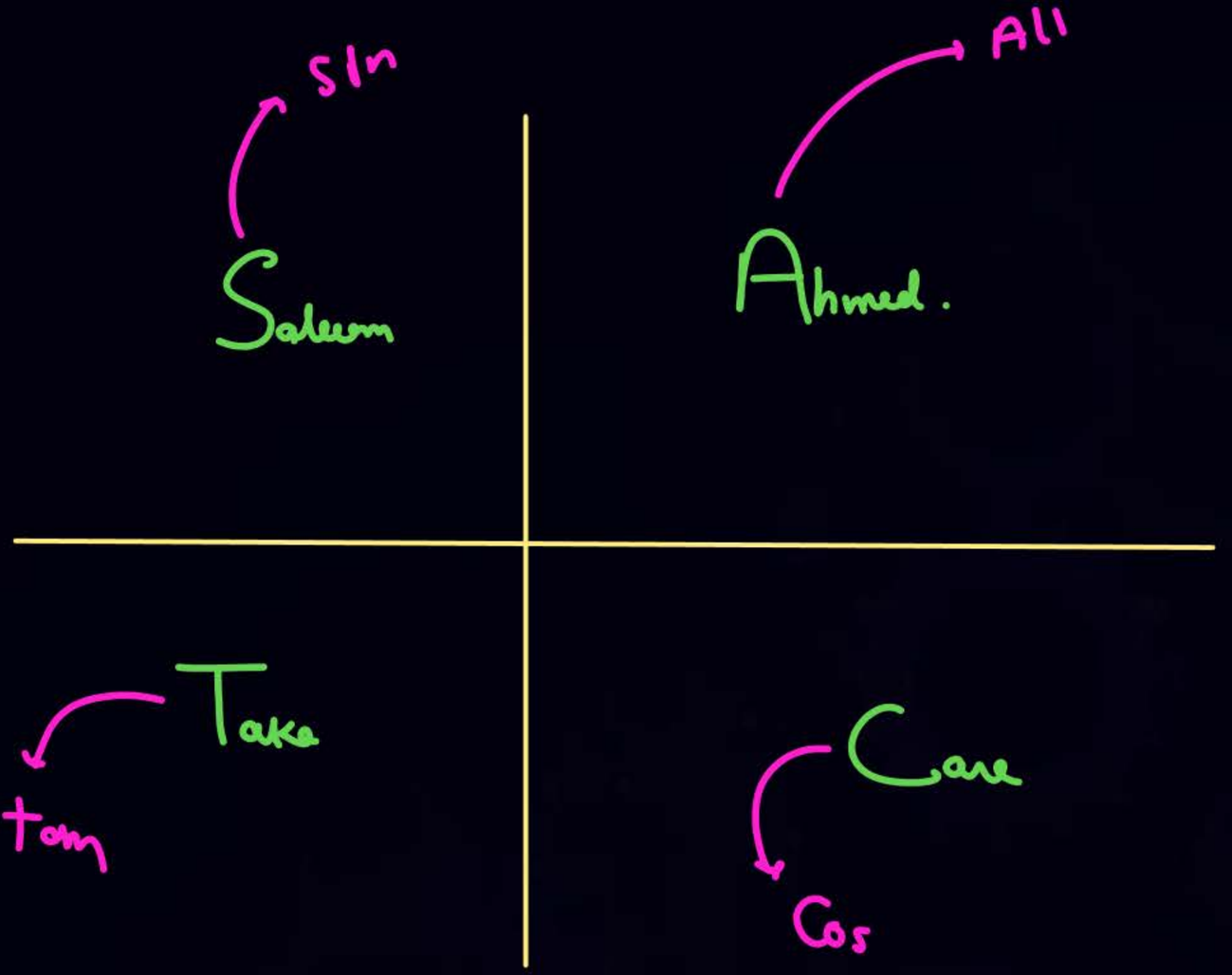
If θ is very small $\underline{\cos\theta \longrightarrow 1}$

$$\sin\theta = \frac{1}{\operatorname{cosec}\theta}$$

$$\tan\theta = \frac{1}{\cot\theta}$$

$$\cos\theta = \frac{1}{\sec\theta}$$

SKC



SKC

① सबसे पहले angle को $180^\circ \pm$, $360^\circ \pm$ मे तोड़ लो

② quad. पता करके +/- लिखो

③ $(180^\circ \pm \quad 360^\circ \pm)$ को भूल जाओ

$\sin 120^\circ = \sin(180-60) = +\frac{\sqrt{3}}{2}$

$\sin 150^\circ = \sin(180-30) = +\frac{1}{2}$

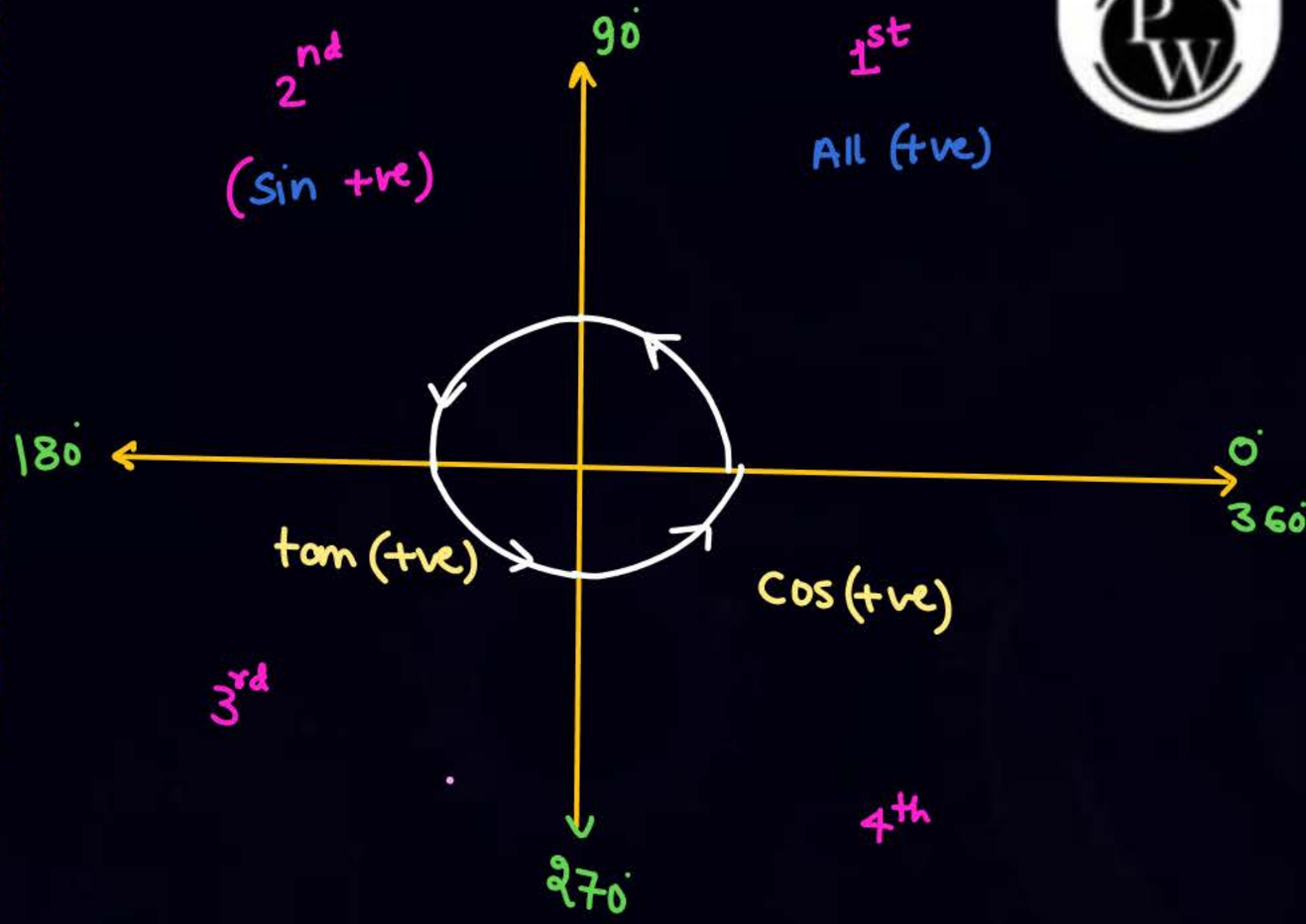
$\sin 210^\circ = \sin(180+30) = -\frac{1}{2}$

$\cos 210^\circ = \cos(180+30) = -\frac{\sqrt{3}}{2}$

$\cos 240^\circ = \cos(180+60) = -\frac{1}{2}$

$\cos 300^\circ = \cos(360-60) = +\frac{1}{2}$

$\tan 300^\circ = \tan(360-60) = -\sqrt{3}$



$\sin 135 = \sin(180-45) = +\frac{1}{\sqrt{2}}$

$\sin 210^\circ = \sin(180+30) = -\frac{1}{2}$

$\cos 210^\circ = \cos(180+30) = -\sqrt{3}/2$

$\tan 210^\circ = \tan(180+30) = +\frac{1}{\sqrt{3}}$

$\sin 240 = -\frac{\sqrt{3}}{2}$

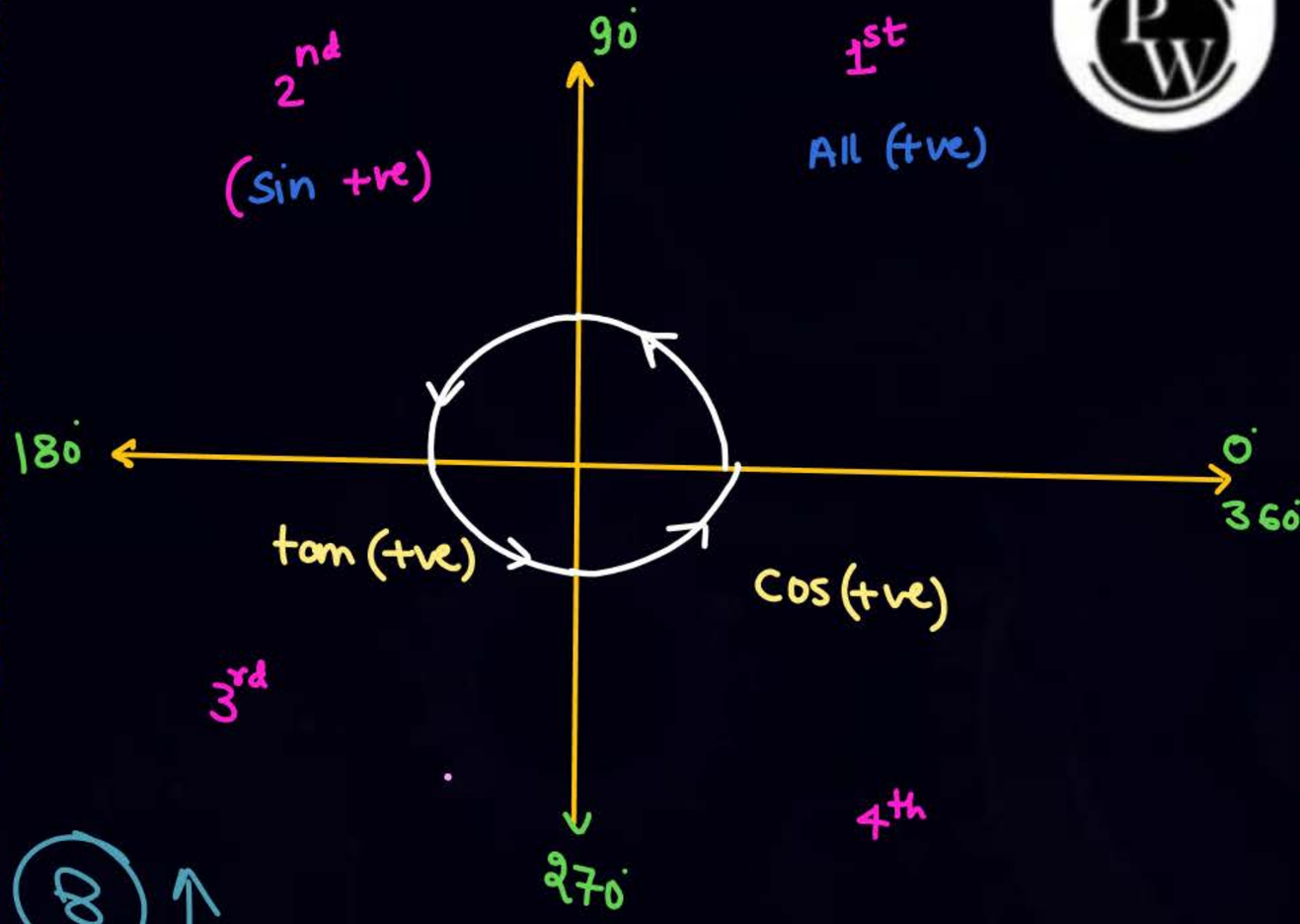
$\cos 240 = \cos(180+60) = -\frac{1}{2}$

$\tan 240 = +\sqrt{3}$

$\sin 300 = -\sqrt{3}/2$

$\cos 300 = +\frac{1}{2}$

$\tan 300 = -\sqrt{3}$



$\sin 150^\circ = +\frac{1}{2}$

$\sin 330^\circ = \sin(360-30) = -\frac{1}{2}$

$\sin 240 = -\sqrt{3}/2$

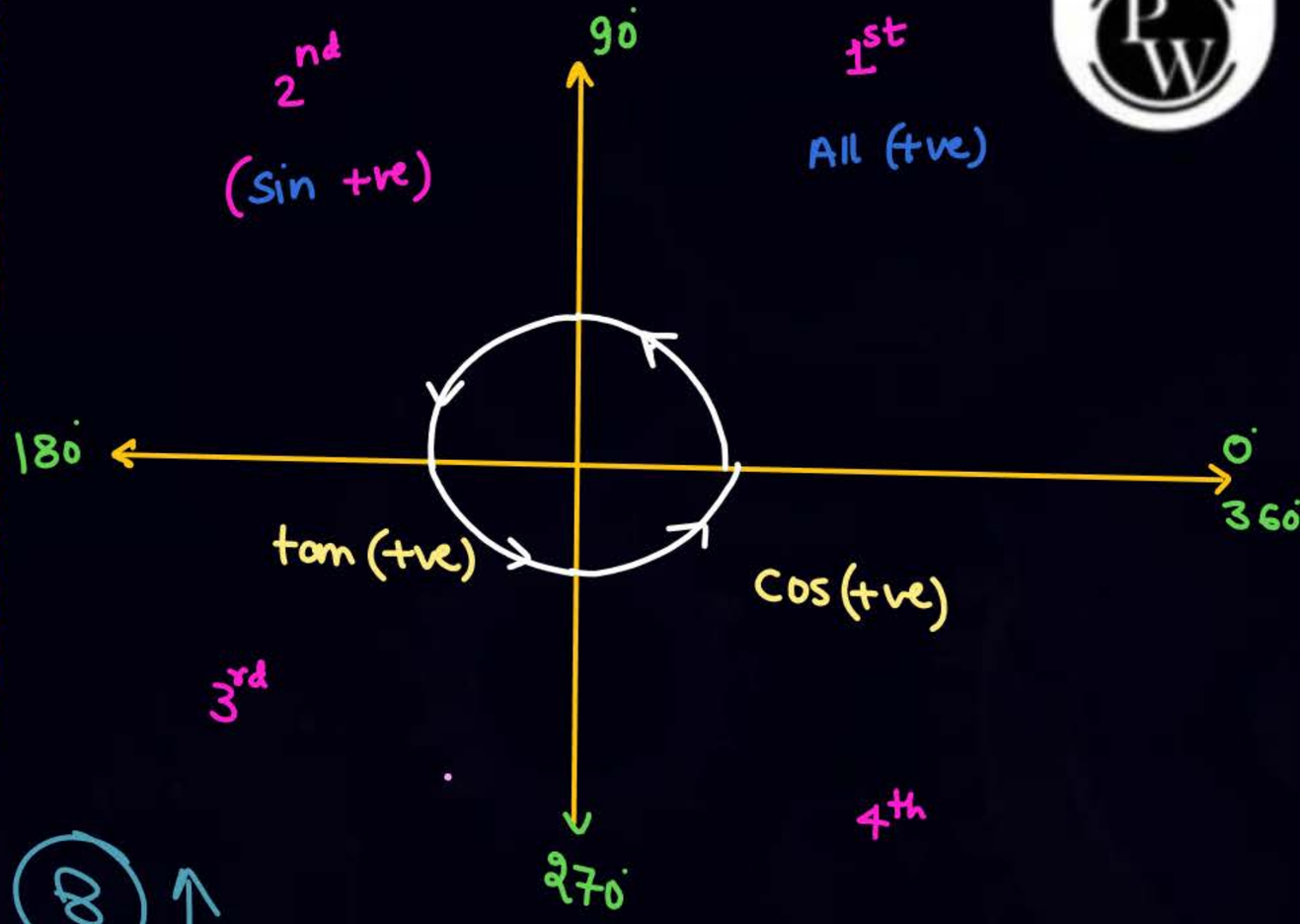
$\tan 330 = -\frac{1}{\sqrt{3}}$

$\tan 210 = +\frac{1}{\sqrt{3}}$

$\cos 330 = +\sqrt{3}/2$

$\cos 120 = -\frac{1}{2}$

$\cos 150 = -\frac{\sqrt{3}}{2}$



(8)

$\sin 180 = 0$

$\cos 180 = -1$

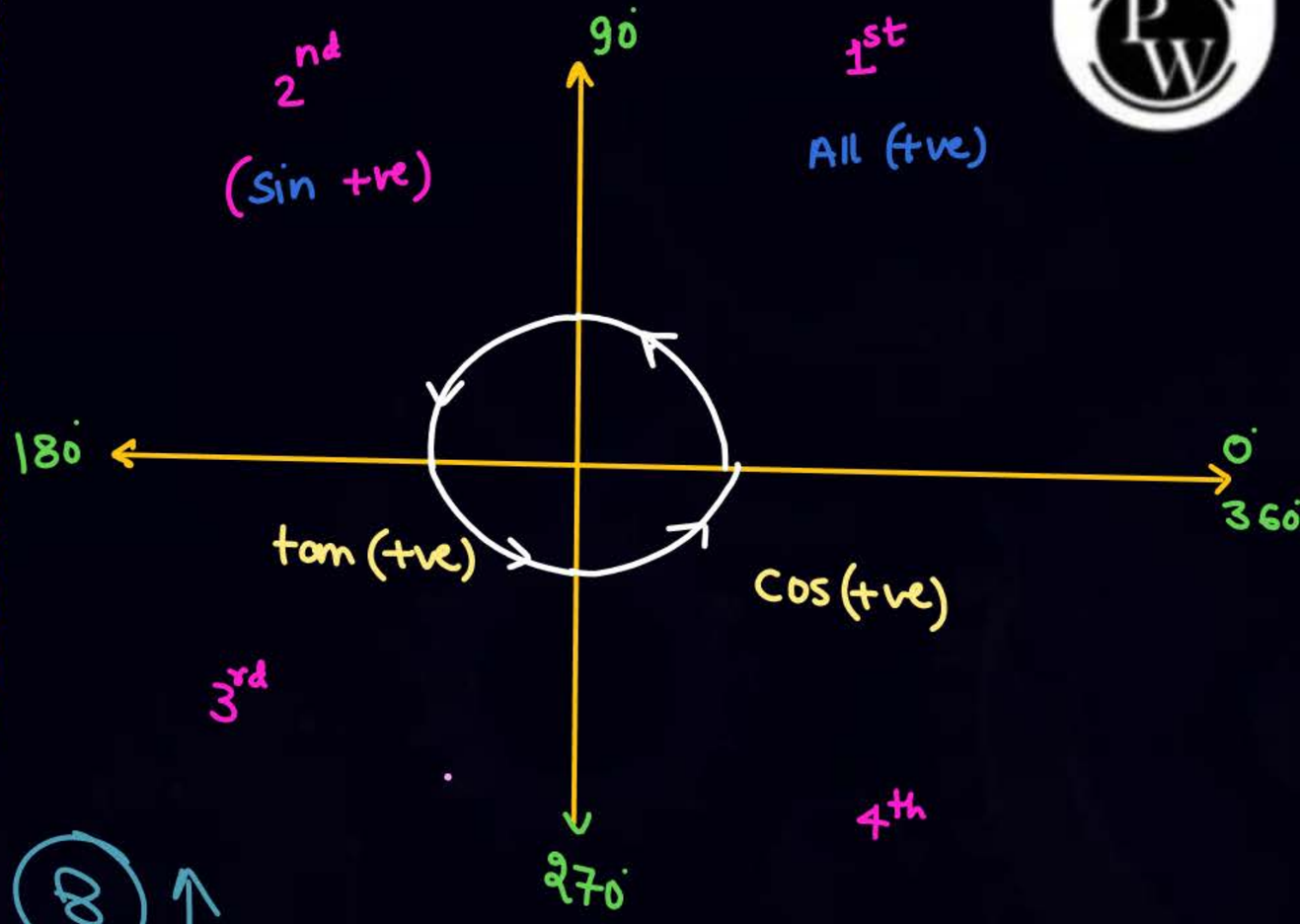
$\tan 180 = 0$

$\sin 270 = -1$

$\cos 270 = 0$

$\cos 180 = \cos(180+0) = -\cos 0$
$= -1$

$\tan 180 = \tan(180+0)$
$= +\tan 0 = 0$



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$\sin(180+\theta) = -\sin\theta$

$\sin(180-\theta) = +\sin\theta$

$\sin(360-\theta) = -\sin\theta$

$\cos(180+\theta) = -\cos\theta$

$\cos(180-\theta) = -\cos\theta$

$\tan(180+\theta) = +\tan\theta$

$\tan(180-\theta) = -\tan\theta$

$\tan(360-\theta) = -\tan\theta$

$\cos(360-\theta) = \cos\theta$

$\therefore \tan 210^\circ = +\tan 30 = +\frac{1}{\sqrt{3}}$

$\sin 420^\circ = \sin(360+60) = +\frac{\sqrt{3}}{2}$

$\sin 405^\circ = \sin(360+45^\circ) = +\sin 45 = \frac{1}{\sqrt{2}}$

$\tan 420 = \tan(360+60) = +\sqrt{3}$

$\tan 480^\circ = \tan(360+120) = \tan 120$

$= -\sqrt{3}$

$$\begin{cases} \sin(360+\theta) = \sin\theta \\ \cos(360+\theta) = \cos\theta \\ \tan(360+\theta) = \tan\theta \end{cases}$$

Q $\sin 750^\circ = \sin(360+360+30)$

$= \sin 30 = \frac{1}{2}$

Q $\sin 840^\circ = \sin(360+360+120)$

$= \sin 120$

$= +\frac{\sqrt{3}}{2}$

सबसे ज्यादा use होने वाली

$\sin 120 = +\sqrt{3}/2$

$\cos 120 = -1/2$

$\sin 150 = +1/2$

$\cos 150 = -\sqrt{3}/2$

$\sin 180 = 0$

$\cos 180 = -1$

$\sin(n \times 180) = 0$, (if n is integer)

SHM

$\sin 270 = -1$

$\sin 359 = \sin(360 - 1)$

$= -\sin 1^\circ$

$= -\frac{\pi}{180}$

* $\sin(-\theta) = -\sin\theta$
* $\cos(-\theta) = \cos\theta$
* $\tan(-\theta) = -\tan\theta$

$(\sin\theta)_{max} = +1$

$(\sin\theta)_{min} = -1$

$-1 \leq (\sin\theta) \leq 1$

$(\cos\theta)_{max} = +1$

$(\cos\theta)_{min} = -1$

$\boxed{-1 \leq \cos\theta \leq +1}$

$\sin 180^\circ = \sin(180 - 0) = +\sin 0$

$= 0$

$\sin 180 = \sin(180+0) = -\sin 0$

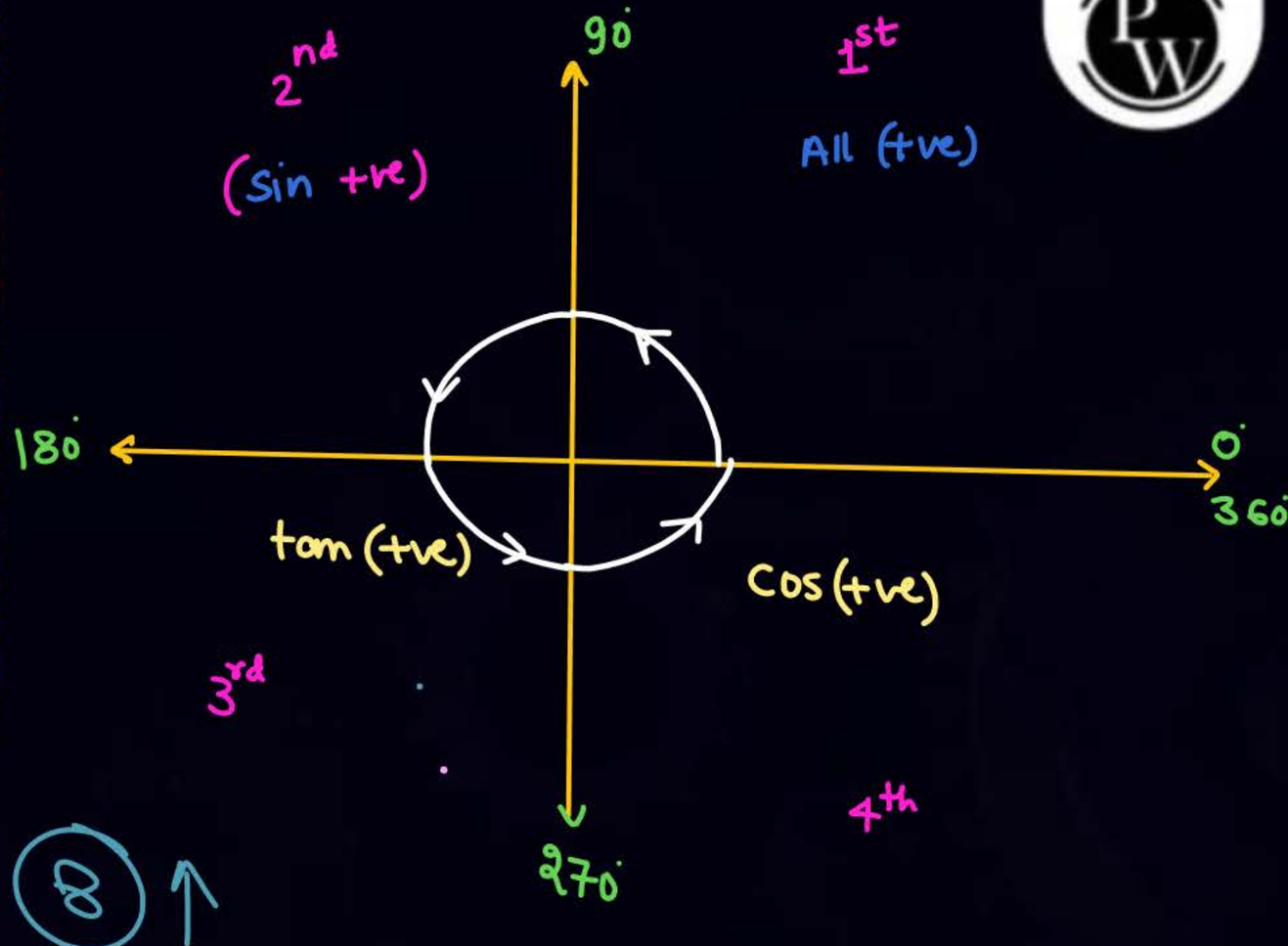
$= 0$

$\sin 270^\circ = \sin(180+90) = -\sin 90$

$= -1$

$\sin 270 = \sin(360-90)$

$= -\sin 90 = -1$



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$\sin 120^\circ \longrightarrow$ +ve

$\sin 150^\circ \longrightarrow$ +ve

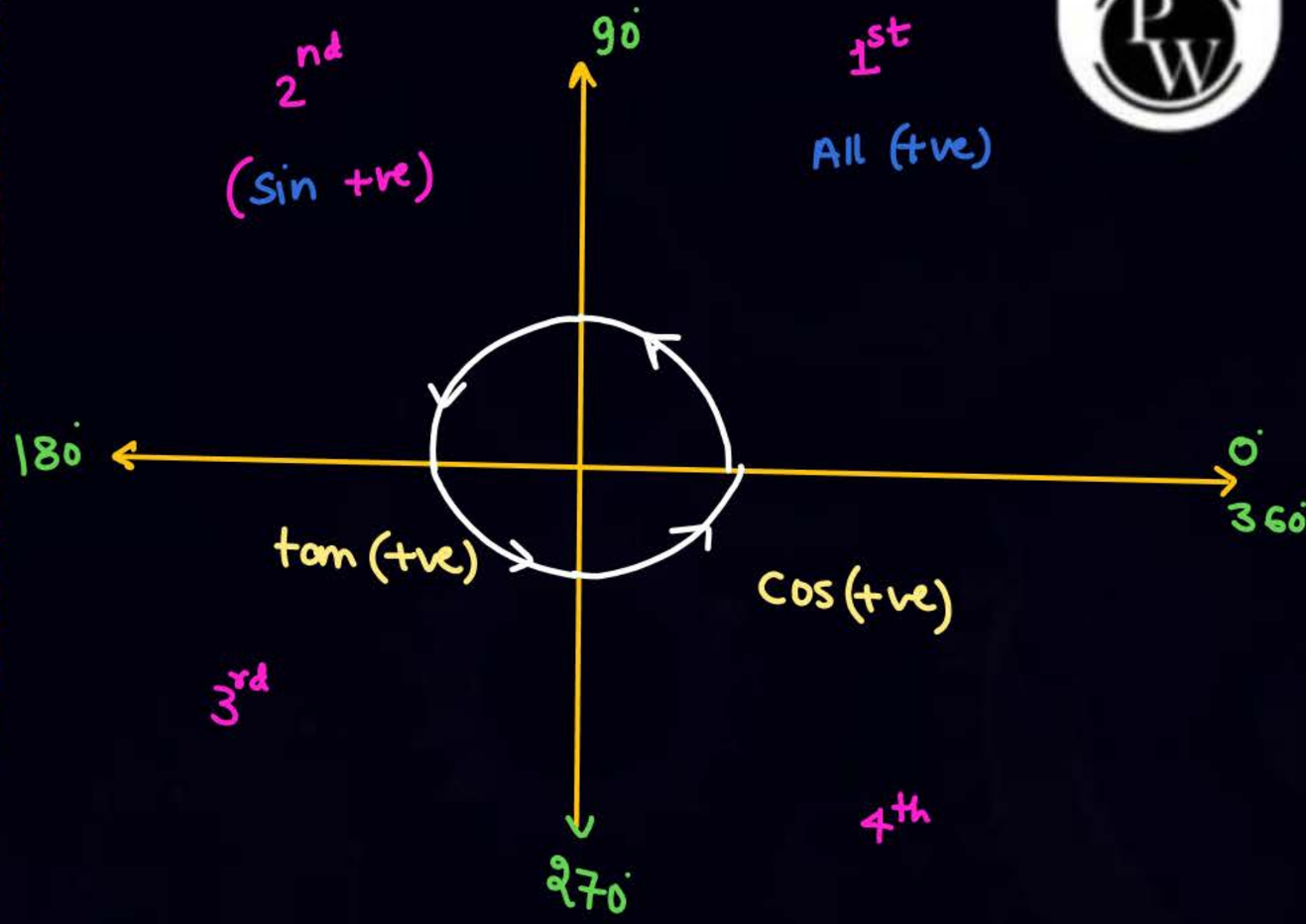
$\sin 210^\circ \longrightarrow$ -ve

$\cos 210^\circ \longrightarrow$ -ve

$\cos 240^\circ \longrightarrow$ -ve

$\cos 300^\circ \longrightarrow$ +ve

$\tan 300^\circ \longrightarrow$ -ve



- π rad = 180 degree
- 1 degree = 60 minute = 3600 sec.


@SALEEMSIR_PW

Homework

- DPP
- Revise your notes.

THANK YOU