रेल रक्षक बैच | TRIGONOMETRY | MATHS

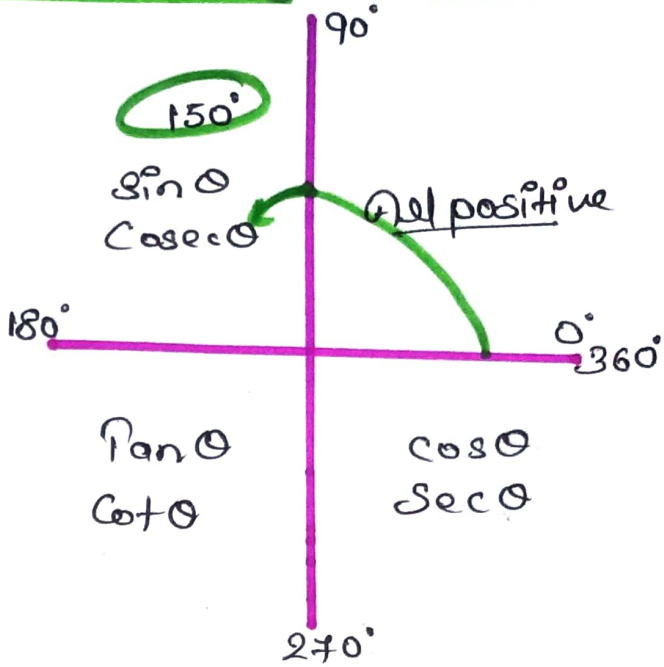
- $\cos 1230^\circ$

$$\begin{array}{r} 1230 \\ 1080 \\ \hline 150 \end{array}$$

$\cos(3\times360+150^\circ)$

-negative-

(IInd quadrant)



Type-01.

1. Find the value of $\sin 60^\circ \cos 60^\circ$.
$\sin 60^\circ, \cos 60^\circ$ का मान ज्ञात कीजिए।

(a) $\frac{1}{2}$
(b) $\frac{\sqrt{3}}{2}$
(c) $\frac{3}{\sqrt{2}}$
(d) $\frac{\sqrt{3}}{4}$

Solve:-

$\sin 60^\circ \cdot \cos 60^\circ$

$\frac{\sqrt{3}}{2} \times \frac{1}{2}$

$\Rightarrow \frac{\sqrt{3}}{4}$ Ans

$\sin 60^\circ = \frac{\sqrt{3}}{2}$

$\cos 60^\circ = \frac{1}{2}$

2. If $\theta = 30^\circ$, then find the value of $\sin\theta . \cos\theta$.
यदि $\theta = 30^\circ$ है, तो $\sin\theta \cos\theta$ का मान ज्ञात कीजिए।

(a) $\frac{3}{8}$
(b) $\frac{\sqrt{3}}{6}$
(c) $\frac{\sqrt{3}}{2}$
(d) $\frac{\sqrt{3}}{4}$

Solve:-

$\sin 30^\circ . \cos 30^\circ$

$\Rightarrow \frac{1}{2} \times \frac{\sqrt{3}}{2}$

$\Rightarrow \frac{\sqrt{3}}{4}$ Ans

3. If $a = 30^\circ$, then find the value of $2\sin a . \cos a$.

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यदि $a = 30°$ है, तो $2\sin a . \cos a$ का मान ज्ञात कीजिए।

(a) $\frac{\sqrt{2}}{3}$

(b) $\frac{2}{\sqrt{3}}$

(c) $\frac{1}{\sqrt{3}}$

(d) $\frac{\sqrt{3}}{2}$

Solve :-

$2 \sin 30° . \cos 30°$

$2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2}$

$\Rightarrow \frac{\sqrt{3}}{2}$ ✓

4. If $\theta = 60°$, then find the value of $\frac{2\cot^2\theta}{1-\cot^2\theta}$.

यदि $\theta = 60°$ है, तो $\frac{2\cot^2\theta}{1-\cot^2\theta}$ का मान ज्ञात कीजिए।

(a) $\sqrt{3}$

(b) $\frac{1}{\sqrt{3}}$

(c) 2

(d) 1.

Solve :-

$\frac{2\cot^2 60°}{1-\cot^2 60°} \Rightarrow \frac{2\times\left(\frac{1}{\sqrt{3}}\right)^2}{1-\left(\frac{1}{\sqrt{3}}\right)^2} \Rightarrow \frac{2\times\frac{1}{3}}{1-\frac{1}{3}} \Rightarrow \frac{\frac{2}{3}}{\frac{2}{3}} \Rightarrow 1$ ✓

$\cot 60° = \frac{1}{\sqrt{3}}$

$5 - \frac{20}{7}$

$\Rightarrow \frac{35-20}{7} \Rightarrow \frac{15}{7}$

$2 - \frac{3}{2}$

$\Rightarrow \frac{4-3}{2} = \frac{1}{2}$

5. $\frac{\sin 30°}{1+\cos 30°} + \frac{1+\cos 30°}{\sin 30°} = ?$

(a) 3

(b) 1

(c) 2

(d) 4

Solve :-

$\sin 30° = \frac{1}{2}$

$\cos 30° = \frac{\sqrt{3}}{2}$

$\Rightarrow \frac{\frac{1}{2}}{1+\frac{\sqrt{3}}{2}} + \frac{1+\frac{\sqrt{3}}{2}}{\frac{1}{2}}$

$\Rightarrow \frac{\frac{1}{2} + \frac{2+\sqrt{3}}{2}}{\frac{(2+\sqrt{3})}{2} \cdot \frac{1}{2}}$

$\Rightarrow \frac{1}{(2+\sqrt{3})} + (2+\sqrt{3})$

$\Rightarrow \frac{1+(2+\sqrt{3})^2}{(2+\sqrt{3})}$

$\Rightarrow \frac{1+4+3+4\sqrt{3}}{2+\sqrt{3}}$

$\Rightarrow \frac{8+4\sqrt{3}}{2+\sqrt{3}}$

$\Rightarrow \frac{4(2+\sqrt{3})}{(2+\sqrt{3})} \Rightarrow 4.$ ✓

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6. Find the value of $\sin 420°$.

$\sin 420°$ का मान ज्ञात कीजिए।

(a) $\frac{3}{\sqrt{2}}$

(b) $\frac{\sqrt{3}}{2}$

(c) $\frac{2}{\sqrt{3}}$

(d) $\frac{1}{\sqrt{3}}$

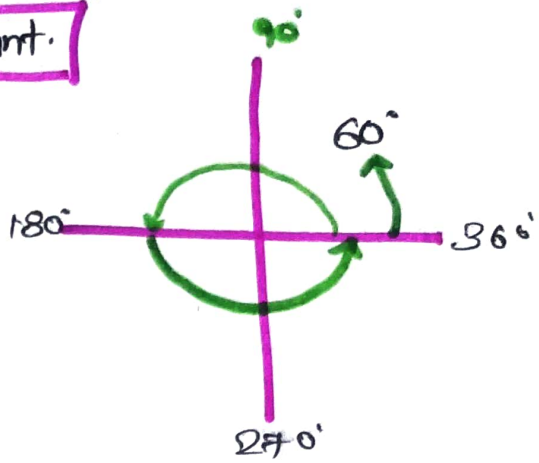
Solve :

$\sin 420°$ — Ist Quadrant.

$\sin(360+60)$

$\Rightarrow \sin 60°$

$\Rightarrow \frac{\sqrt{3}}{2}$ //



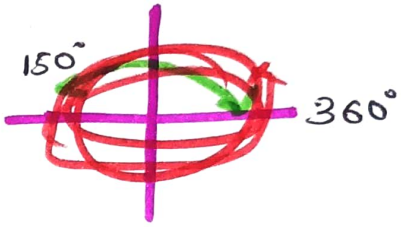
1. $\sin 1820°$

$\sin(5\times360+20) \Rightarrow$ Ist. //

2. $\tan 3750°$

$\tan(10\times360+150°)$

$\Rightarrow$ IInd Quadrant //



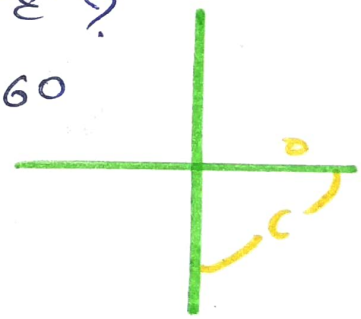
$\cos 2490°$ किस चतुर्थांश में है ?

$\cos(7\times360-30°)$

$\Rightarrow \cos 30°$

$\Rightarrow \frac{\sqrt{3}}{2}$ //

$360\times6 \Rightarrow 2160$



$\cos(9\times270+60)$

$\sin 60° = \frac{\sqrt{3}}{2}$ //

$270\times9 \Rightarrow 2430.$

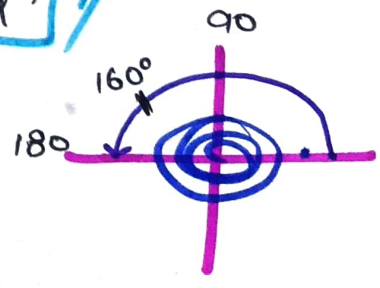
$$\begin{array}{r} 2490 \\ -2430 \\ \hline 60 \end{array}$$

$\tan 5200° = ?$

$\tan(14\times360+160) \Rightarrow$ negative, IInd Quadrant. //

$360\times13 = 4680$

$360\times14 = 5040$



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Cos 3900°

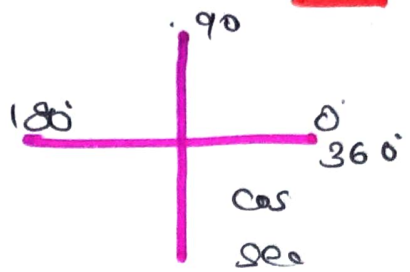
i) चतुर्थांश = ? IVth "

ii) (+) या (−) = ? (+) "

360×11
3960

$\Rightarrow \cos(11 \times 360 - 60°)$

$\Rightarrow \cos 60° = \frac{1}{2}$ "



10. If $\sin^2\beta - \sin 30° = 0$, then find the value of β.

यदि $\sin^2\beta - \sin 30° = 0$ है, तो β का मान ज्ञात कीजिए।

(a) 45°
(b) 0°
(c) 90°
(d) 60°

Solve:

$\sin^2\beta = \frac{1}{2}$

$\sin\beta = \sqrt{\frac{1}{2}} \Rightarrow \frac{1}{\sqrt{2}}$

$\sin\beta = \sin 45°$

$\beta = 45°$ "

$\sin^2\beta - \sin 30 = 0$

$(\sin^2\beta) - \frac{1}{2} = 0$

$\frac{1}{2} - \frac{1}{2} = 0$