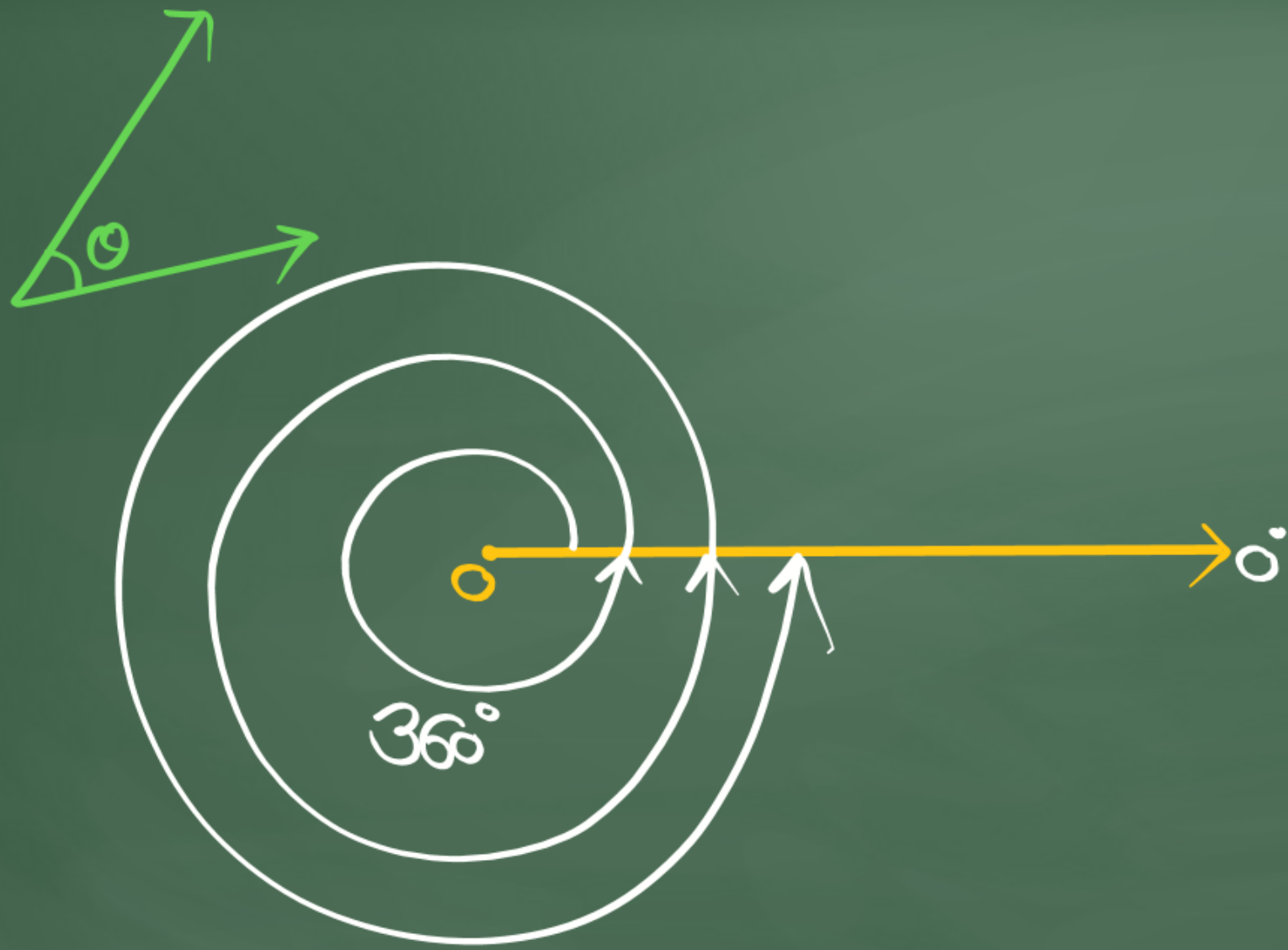
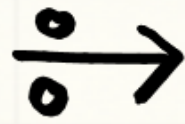


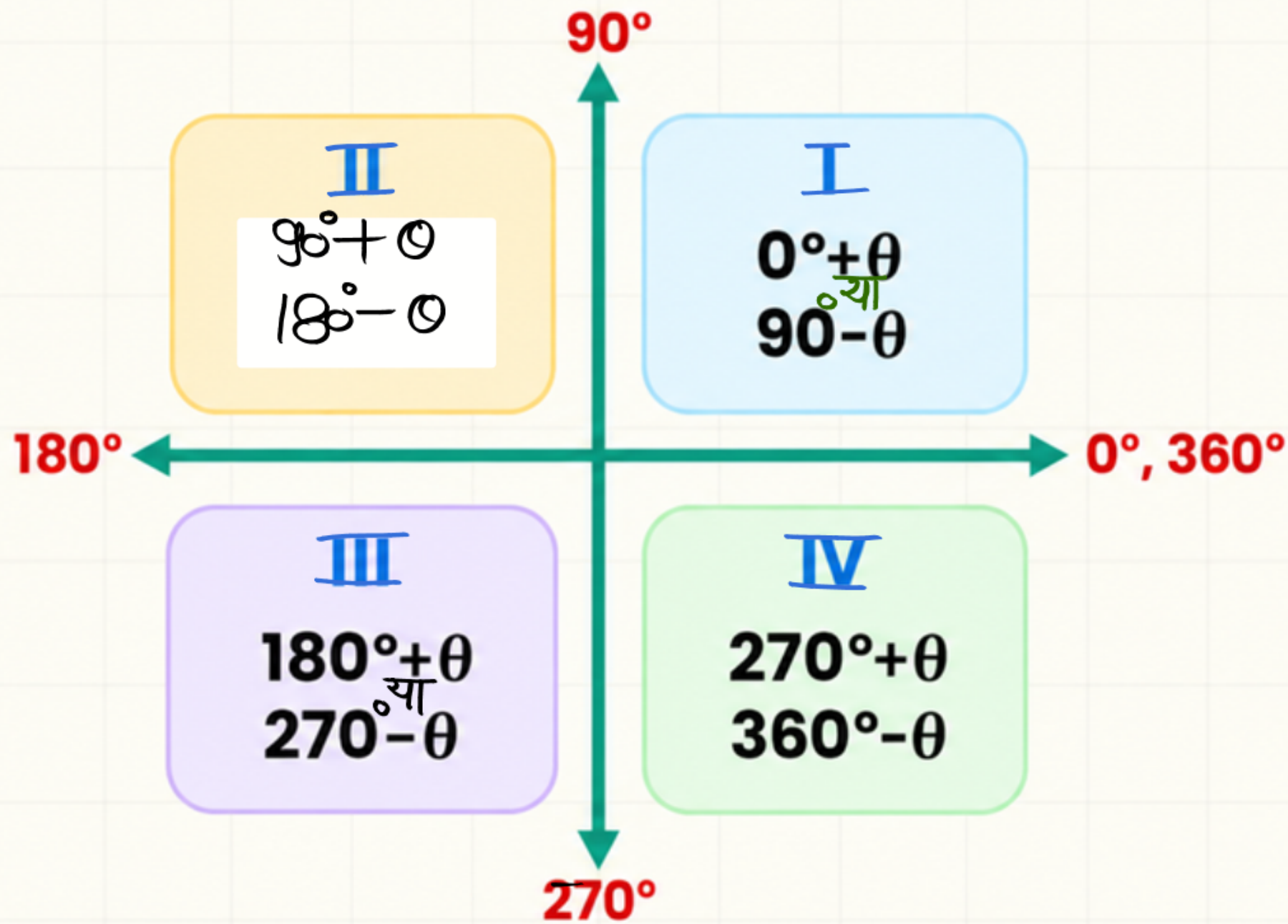


$$0^\circ = 360^\circ = 720^\circ = 1080^\circ - \dots$$

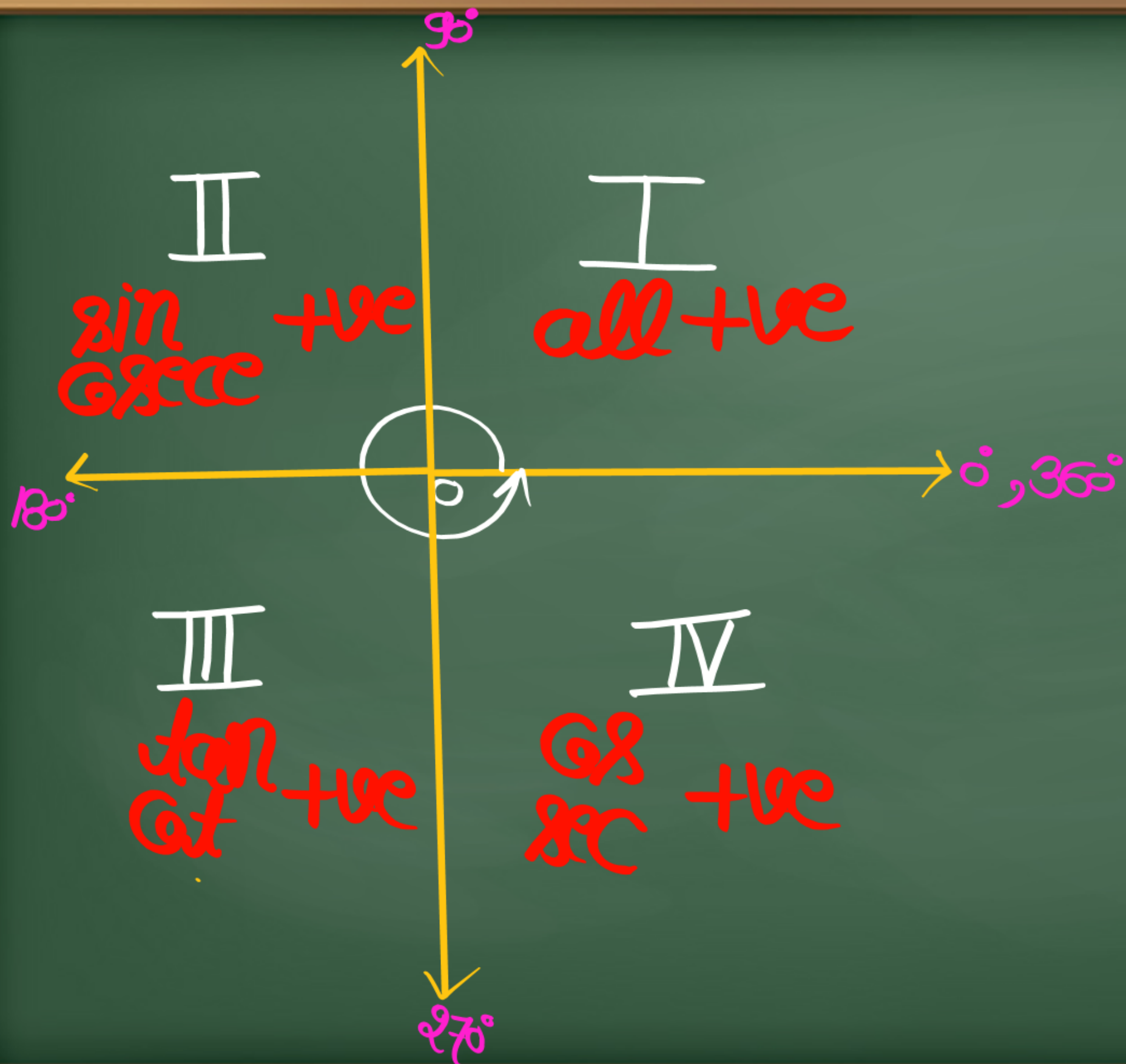
Quadrant (चतुर्थी)



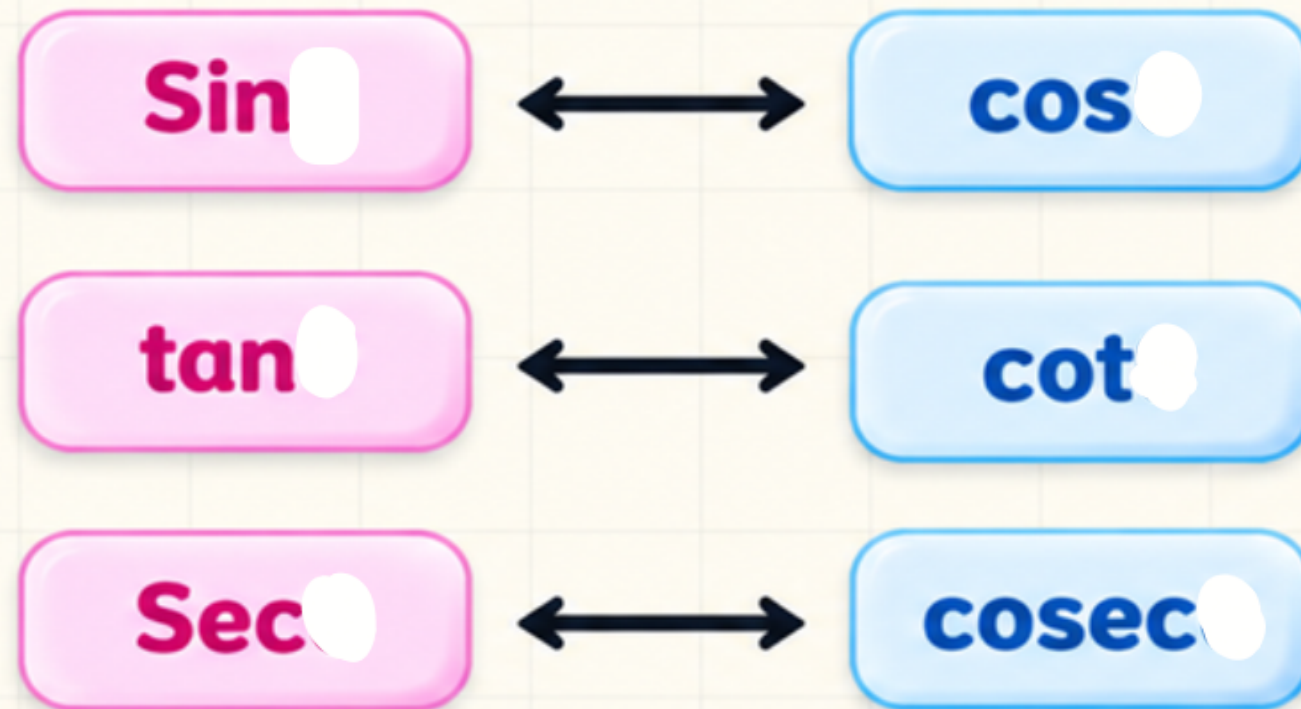
माना θ = acute angle



ASTC

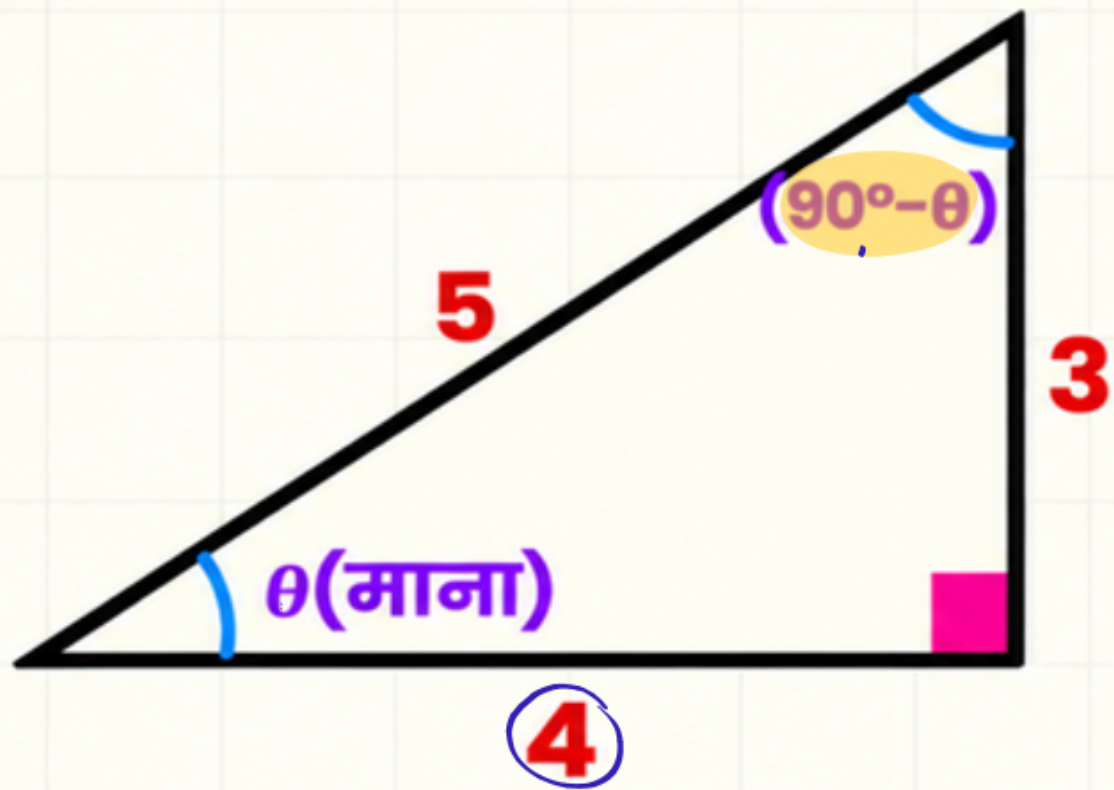


$90^\circ, 270^\circ, 450^\circ \dots$ पर Change होता है



$180^\circ, 360^\circ, 540^\circ \dots$ पर No Change





$$\sin(90^\circ - \theta) = \frac{4}{5}$$

$$\cos \theta = \frac{4}{5}$$

$90^\circ - \theta$
↓
Ist

$$\sin(90^\circ - \theta) = \frac{4}{5} = \cos \theta$$

$$\cos(90^\circ - \theta) = \frac{3}{5} = \sin \theta$$

$$\cos(90^\circ - \theta) = +\sin \theta$$

$$\sin(90^\circ - \theta) = +\cos \theta$$

$$\tan(90^\circ - \theta) = \cot \theta$$

$$\cot(90^\circ - \theta) = \tan \theta$$

$(90^\circ + \theta) \rightarrow \text{II}^{\text{nd}} \text{ Quadrant (sin}\theta \text{ \& cosec}\theta \text{ +ve)}$

$$\sin(90^\circ + \theta) = +\cos\theta$$

$$\cos(90^\circ + \theta) = -\sin\theta$$

$$\tan(90^\circ + \theta) = -\cot\theta$$

$$\cot(90^\circ + \theta) = -\tan\theta$$

$$\sec(90^\circ + \theta) = -\csc\theta$$

$$\csc(90^\circ + \theta) = +\sec\theta$$

$$\begin{aligned}\cos 120^\circ &= \cos(90^\circ + 30^\circ) \\ &= -\sin 30^\circ \\ &= -\frac{1}{2}\end{aligned}$$

$$\begin{aligned}\tan 150^\circ &= \tan(90^\circ + 60^\circ) \\ &= -\cot 60^\circ \\ &= -\frac{1}{\sqrt{3}}\end{aligned}$$

$$\text{Gsec } 135^\circ = \text{Gsec } (90^\circ + 45^\circ)$$

$$= +\text{sec } 45^\circ$$

$$= +\sqrt{2}$$

$(180^\circ - \theta) \rightarrow \text{II}^{\text{nd}} \text{ Quadrant}$

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

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

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

$$\sec(180^\circ - \theta) = -\sec\theta$$

180° पर no change

$$\begin{aligned}\sin 120^\circ &= \sin(90^\circ + 30^\circ) \\ &= +\cos 30^\circ \\ &= \frac{\sqrt{3}}{2}\end{aligned}$$

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

$(180^\circ + \theta)$
 $(270^\circ - \theta)$ → IIIrd Quadrant

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

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

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

$$\cot(180^\circ + \theta) = +\cot \theta$$

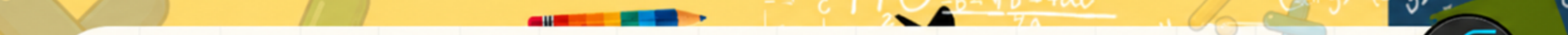
$$\operatorname{Cosec}(180^\circ + \theta) = -\operatorname{cosec} \theta$$

$$\sin(270^\circ - \theta) = -\cos \theta$$

$$\cos(270^\circ - \theta) = -\sin \theta$$

$$\tan(270^\circ - \theta) = +\cot \theta$$

$$\sec(270^\circ - \theta) = -\operatorname{cosec} \theta$$


$$\begin{aligned}\sin 225^\circ &= \sin(180^\circ + 45^\circ) \\ &= -\sin 45^\circ \\ &= -\frac{1}{\sqrt{2}}\end{aligned}$$

$$\begin{aligned}\sec 240^\circ &= \sec(180^\circ + 60^\circ) \\ &= -\sec 60^\circ \\ &= -2\end{aligned}$$

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


$(270^\circ + \theta) \rightarrow \text{IV}^{\text{th}} \text{ Quadrant}$
 $(360^\circ - \theta = -\theta)$

Cos & Sec +ve

$$\text{Sin}(270^\circ + \theta) = -\cos \theta$$

$$\text{Cos}(270^\circ + \theta) = +\sin \theta$$

$$\text{Cot}(270^\circ + \theta) = -\tan \theta$$

$$360^\circ = 0^\circ$$

$$360^\circ - \theta = -\theta$$

$$310^\circ = -50^\circ$$

$$\text{Sin}(-\theta) = -\sin \theta$$

$$\text{Cos}(-\theta) = +\cos \theta$$

$$\text{tan}(-\theta) = -\tan \theta$$

$$\text{cot}(-\theta) = -\cot \theta$$

$$\text{sec}(-\theta) = +\sec \theta$$

$$\text{cosec}(-\theta) = -\csc \theta$$

$$\text{Cos } (-30^\circ) = \text{Cos } 30^\circ = \frac{\sqrt{3}}{2}$$

$$\text{Sin } 330^\circ = \text{Sin } (360^\circ - 30^\circ)$$

$$= \text{Sin } (-30^\circ)$$

$$= -\text{Sin } 30^\circ = -\frac{1}{2}$$

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

$$\text{tan } 765^\circ = \text{tan } 45^\circ = 1$$

$$765^\circ = \cancel{360^\circ \times 2} + 45^\circ$$

$$\sec 105^\circ = \sec(-30^\circ) = -\sec 30^\circ = -2$$

$$105^\circ = \cancel{30^\circ \times 3} - 30^\circ$$

$$= -30^\circ$$

$$\sin 120^\circ = \frac{\sqrt{3}}{2}$$

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

$$\sin 180^\circ = 0$$

$$\cos 180^\circ = -1$$

$$\tan 135^\circ = \cot 135^\circ = -1$$

$$\tan 225^\circ = \cot 225^\circ = 1$$

याद करें

$$\begin{aligned}\tan 135^\circ &= \tan(180^\circ - 45^\circ) \\ &= -\tan 45^\circ \\ &= -1\end{aligned}$$

124. If $\tan \theta = \frac{5}{12}$ and θ is in Quadrant III, what is the value of $\sin \theta$?

यदि $\tan \theta = \frac{5}{12}$ और θ चतुर्थांश III में है तो का मान क्या है $\sin \theta$?

(RRB GROUP-D 2025)

[A] $\frac{5}{13}$
[C] $\frac{12}{13}$

[B] $-\frac{5}{13}$
[D] $-\frac{12}{13}$

$-\frac{5}{13}$

$\tan \theta = \frac{5}{12}$

125. What is the value of $\tan 570^\circ$?

$\tan 570^\circ$ का मान ज्ञात कीजिये?

SSC CHSL PRE 2024

[A] $-1/\sqrt{3}$

[B] $-\sqrt{3}$

[C] $1/\sqrt{3}$

[D] $\sqrt{3}$

$$\tan(\cancel{360^\circ} + 30^\circ)$$

$$\tan 30^\circ = \tan(180^\circ + 30^\circ)$$

$$= +\tan 30^\circ$$

$$= \frac{1}{\sqrt{3}}$$

126. If θ be acute angle and $\cos \theta = \frac{24}{25}$, then find $\cot(90^\circ - \theta)$?

यदि θ न्यून कोण है और $\cos \theta = \frac{24}{25}$ तो $\cot(90^\circ - \theta)$ ज्ञात कीजिए?

SSC CHSL PRE 2024

[A] $5/24$

[C] $7/25$

[B] $7/24$

[D] $6/25$

$= + \tan \theta$

$= \frac{7}{24}$

!#(v.v.v.vimp)

If, $A + B = 90^\circ \rightarrow A, B$ are Complementary to each other

- $\sin A = \cos B \rightarrow \sin A \cdot \sec B = 1$
- $\tan A = \cot B \rightarrow \tan A \cdot \tan B = 1$ (or) $\cot A \cdot \cot B = 1$
- $\sec A = \operatorname{cosec} B \rightarrow \cos A \cdot \operatorname{cosec} B = 1$

Ex:- $\sin 49^\circ \times \sec 41^\circ = 1$

Ex:- $\tan 31^\circ \times \tan 59^\circ = 1$

Ex:- $\cos 74^\circ \times \operatorname{cosec} 16^\circ = 1$

Ex:- $\cot 26^\circ \times \cot 64^\circ =$

Ex:- $\sin^2 58^\circ + \sin^2 32^\circ = 1$

$$\mathcal{L}A = \mathcal{O} \mathcal{L}B$$

$$\frac{1}{G_A} \Rightarrow G_B$$

$$\sin^2 A + \sin^2 B = 1$$

$$\cos^2 A + \cos^2 B = 1$$

$$\cos(71^\circ + \alpha) + \cos(19^\circ - \alpha) =$$

$$A+B=90^\circ$$

$$\sin^2 A + \sin^2 B$$

↘

$$\sin^2 B + \sin^2 B = 1$$

$$70^\circ \text{ \& } 20^\circ$$

$$48^\circ \text{ \& } 42^\circ$$

$$\theta^\circ \text{ \& } (90^\circ - \theta)$$

पूरक कोण

$$66^\circ \leftrightarrow 24^\circ$$

$$54^\circ \leftrightarrow 36^\circ$$

$$A + B = 90^\circ$$

$$\rightarrow A' = 90^\circ - B$$

$$\sin A = \sin(90^\circ - B) = \cos B$$

$$\tan A = \tan(90^\circ - B) = \cot B$$

$$\sec A = \sec(90^\circ - B) = \operatorname{cosec} B$$

$$\sin 59^\circ$$

=

$$\csc 31^\circ$$

$$\cos 28^\circ$$

=

$$\sin 62^\circ$$

$$\tan 46^\circ$$

=

$$\cot 44^\circ$$

$$\operatorname{cosec} 37^\circ$$

=

$$\sec 53^\circ$$

$$180^\circ = \pi \text{ रेडियन}$$

$$1^\circ = \frac{\pi}{180^\circ} \text{ रेडियन}$$

$$60^\circ = \frac{\pi}{3} \text{ रेडियन}$$

$$\sec 78^\circ = \csc 12^\circ$$

127. Express in $\sin 54^\circ + \cos 72^\circ$ in terms of Trigonometric ratios of angles between 0° & 45° ?
 $\sin 54^\circ + \cos 72^\circ$ को 0° और 45° के बीच के कोणों के त्रिकोणमितीय अनुपात के रूप में व्यक्त करें?

RRB TECHNICIAN GRADE-3 2024

- [A] $\cos 36^\circ + \cos 18^\circ$ [B] $\sin 36^\circ + \sin 18^\circ$
[C] $\sin 36^\circ + \cos 18^\circ$ [D] $\cos 36^\circ + \sin 18^\circ$

$$\begin{aligned} & \sin 54^\circ + \cos 72^\circ \\ \Rightarrow & \cos 36^\circ + \sin 18^\circ \end{aligned}$$

128. If $\cos 27^\circ = x$, then the value of $\tan 63^\circ$ is:

यदि $\cos 27^\circ = x$ है, तो $\tan 63^\circ$ का मान है:

SSC CHSL 2022 PRE

[A] $\frac{\sqrt{1+x^2}}{x}$

[B] $\frac{x}{\sqrt{1+x^2}}$

[C] $\frac{\sqrt{1+x^2}}{x}$

[D] $\frac{x}{\sqrt{1-x^2}}$

$\cos 27^\circ = \frac{adj}{hyp} = \frac{x}{1} \rightarrow \cos 27^\circ = x$

$\tan 63^\circ = \tan (90^\circ - 27^\circ) = \cot 27^\circ = \frac{hyp}{adj} = \frac{1}{x}$

129. If $\sin 31^\circ = \alpha$, then the value of $\cot 59^\circ$ is:

यदि $\sin 31^\circ = \alpha$ है, तो $\cot 59^\circ$ का मान ज्ञात कीजिए।

SSC CGL 2023 PRE

[A] $\frac{\sqrt{1-\alpha^2}}{2\alpha}$

[B] $\frac{\alpha}{\sqrt{1-\alpha^2}}$

[C] $\frac{\sqrt{1+\alpha^2}}{\alpha}$

[D] $\frac{\alpha}{\sqrt{1+\alpha^2}}$

H.W

130. What is the value of $\frac{4}{3}(\sin^2 35^\circ + \sin^2 55^\circ)$?

$\frac{4}{3}(\sin^2 35^\circ + \sin^2 55^\circ)$ का मान क्या है?

SSC CHSL TIER – I 2022

[A] $8/9$

[B] $4/3$

[C] $3/4$

[D] $2/3$

131. Find the value of $\frac{\sin 80^\circ}{\cos 10^\circ} - \sin 57^\circ \sec 33^\circ + 2$.
 $\frac{\sin 80^\circ}{\cos 10^\circ} - \sin 57^\circ \sec 33^\circ + 2$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] **2** $1 - 1 + 2$
 [C] **3**

[B] **1**
 [D] **0**

$$\sin 80^\circ = \cos 10^\circ$$

132. Find the value of $\frac{\sin 15^\circ}{\cos 75^\circ} + \frac{\cos 78^\circ}{\sin 12^\circ} - 1$.

~~$\frac{\sin 15^\circ}{\cos 75^\circ} + \frac{\cos 78^\circ}{\sin 12^\circ} - 1$~~ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] 3

[B] 0

[C] 1

[D] 2

HHH

133. Find the value of

$$\frac{\cos 35^\circ}{\sin 55^\circ} + \frac{\cos 79^\circ}{\sin 11^\circ} - 2\cos 27^\circ \operatorname{cosec} 63^\circ \text{ का मान ज्ञात कीजिए।}$$

(RRB GROUP-D 2025)

[A] 0

[C] -1

[B] 1

[D] 2

1+1-2

134. What is the value of $\frac{5}{2} \left\{ \frac{\cos 37^\circ}{\sin 53^\circ} \right\} - \frac{1}{2} (\sin^2 39^\circ + \sin^2 51^\circ)$?

$\frac{5}{2} \left\{ \frac{\cos 37^\circ}{\sin 53^\circ} \right\} - \frac{1}{2} (\sin^2 39^\circ + \sin^2 51^\circ)$ का मान क्या है?

SSC CGL 2023 PRE

[A] $\sin^2 51^\circ - \sin 53^\circ$

[B] $\sin 53^\circ + \tan 51^\circ$

[C] **2**

[D] 1

$$\frac{5}{2} - \frac{1}{2} = 2$$

135. The value of $\left[\frac{\sin^2 27^\circ + \sin^2 63^\circ}{\cos^2 24^\circ + \cos^2 66^\circ} - \sin^2 69^\circ \cos 69^\circ \sin 21^\circ \right]$ is:

$\left[\frac{\sin^2 27^\circ + \sin^2 63^\circ}{\cos^2 24^\circ + \cos^2 66^\circ} - \sin^2 69^\circ \cos 69^\circ \sin 21^\circ \right]$ का मान ज्ञात करें।

SSC CGL 2024 PRE

$-(\sin^2 69^\circ + \cos^2 69^\circ)$

[A] 3

[B] 2

[C] 0

[D] 1

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

136. The value of $\frac{\sin^2 48^\circ + \sin^2 42^\circ}{\tan^2 40^\circ - \operatorname{cosec}^2 50^\circ}$ is:

$\frac{\sin^2 48^\circ + \sin^2 42^\circ}{\tan^2 40^\circ - \operatorname{cosec}^2 50^\circ}$ का मान ज्ञात कीजिए।

RRB TECHNICIAN GRADE-3 2024

[A] 1

+

[B] 2

[C] 0

[D] -1

$$\operatorname{cosec} \theta - \cot \theta = 1$$

$$\cot \theta - \operatorname{cosec} \theta = -1$$

137. The value of $\left[\frac{\sin^2 25^\circ + \sin^2 65^\circ}{\cos^2 25^\circ + \cos^2 65^\circ} \right] + \sin^2 57^\circ + \cos 57^\circ \sin 33^\circ$ is:

$\left[\frac{\sin^2 25^\circ + \sin^2 65^\circ}{\cos^2 25^\circ + \cos^2 65^\circ} \right] + \sin^2 57^\circ + \cos 57^\circ \sin 33^\circ$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] -1

[C] 1

[B] 0

[D] 2 ✓

138. The value of $\sin^2 42^\circ + \sin^2 48^\circ + \sec^2 30^\circ - \cot^2 45^\circ$ is:

$\sin^2 42^\circ + \sin^2 48^\circ + \sec^2 30^\circ - \cot^2 45^\circ$ का मान कितना है?

RRB GROUP-D 2026

[A] $\frac{4}{3}$
[C] $\frac{2}{3}$

[B] $\frac{3}{4}$
[D] 1

~~$4\frac{4}{3}$~~

139. Find the value of $\sin^2 10^\circ + \sin^2 80^\circ + \tan^2 45^\circ + \sec^2 60^\circ + \sin^2 30^\circ$.

$\sin^2 10^\circ + \sin^2 80^\circ + \tan^2 45^\circ + \sec^2 60^\circ + \sin^2 30^\circ$ का मान ज्ञात कीजिए।

RRB GROUP-D 2026

[A] $\frac{15}{2}$

[C] $\frac{25}{3}$

[B] $\frac{20}{3}$

~~[D]~~ $\frac{25}{4}$

$$1 + 1 + 4 + \frac{1}{4}$$

$$= 6 + \frac{1}{4}$$

140. **Evaluate:** / निम्न का मान ज्ञात कीजिए:

$$\frac{\sin^2 40^\circ + \sin^2 50^\circ}{\cos^2 40^\circ + \cos^2 50^\circ} - \frac{\sec^2 50^\circ - \cot^2 40^\circ}{\cos^2 20^\circ + \cos^2 70^\circ}$$

[A] 0

[B] 2

[C] -1

[D] -2

$$1 - 1 = 0$$

141. The value of $\frac{\sin^2 48^\circ + \sin^2 42^\circ}{\tan^2 40^\circ - \operatorname{cosec}^2 50^\circ}$ is:

$\frac{\sin^2 48^\circ + \sin^2 42^\circ}{\tan^2 40^\circ - \operatorname{cosec}^2 50^\circ}$ का मान ज्ञात कीजिए।

(RRB TECHNICIAN GRADE-3 2024)

[A] 1

[B] 2

[C] 0

[D] -1

