

$$1 - \cancel{sc} + \cancel{sc} = \textcircled{1}$$

$$\begin{aligned} & 1 - (s^2)^3 \\ &= (1 - s^2) \cdot (1 + s^2 + s^4) \\ &= c^2 \cdot [1 + 1 + c^4 - 2c^2 + s^2] \\ &= c^2 \cdot [c^4 + 2s^2 + 2c^2 - 2c^2 + s^2] \\ &= c^2 \cdot [c^4 + 3s^2] \end{aligned}$$

$$1 = s^2 + c^2$$

$$\begin{aligned} a^3 - b^3 &= (a - b) \cdot (a^2 + ab + b^2) \\ s^4 &= (s^2)^2 = (1 - c^2)^2 \end{aligned}$$

110. Which of the following is/are identity/identities?
निम्नलिखित में से कौन सी सर्वसमिका/सर्वसमिकाएँ है/हैं?

- ← **I.** $\frac{\sin^3 \theta + \cos^3 \theta}{\sin \theta + \cos \theta} + \sin \theta \cos \theta = 1; 0 < \theta < \frac{\pi}{2}$
- II.** $1 - \sin^6 \theta = \cos^2 \theta (\cos^4 \theta + 3 \sin^2 \theta)$

Select the correct answer using the code given below:-
नीचे दिए गए कोड का उपयोग करके सही उत्तर चुनें:-

(CDS 2023)

- [A] I only [B] II only
- [C] Both I and II [D] ~~Neither I nor II~~

$$\frac{\tan A - \cot B}{\frac{1}{\cot B} - \frac{1}{\tan A}} = \frac{\tan A - \cot B}{\frac{\tan A - \cot B}{\tan A \cdot \cot B}} = \tan A \cdot \cot B$$

Trigonometry Ratio Table

Angle (in Degrees)	0°	30°	45°	60°	90°
Angle (in Radians)	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
Sin	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
Cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
Tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not Defined
Cot	Not Defined	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0
Sec	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not Defined
Cosec	Not Defined	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1



131. If $7\sin^2\theta + 4\cos^2\theta = 5$ and θ lies in the first quadrant, then what is the value of $\frac{\sqrt{3}\sec\theta + \tan\theta}{\sqrt{2}\cot\theta - \sqrt{3}\cos\theta}$?

यदि $7\sin^2\theta + 4\cos^2\theta = 5$ और θ पहले चतुर्थांश में स्थित है, तो $\frac{\sqrt{3}\sec\theta + \tan\theta}{\sqrt{2}\cot\theta - \sqrt{3}\cos\theta}$ का मान क्या है?

[A] $2(1 + \sqrt{2})$

[B] $3\sqrt{2}$

[C] $2(\sqrt{2} - 1)$

[D] $4\sqrt{2}$

$0^\circ < \theta < 90^\circ$

$\theta = \text{angle}$

$3\sin^2\theta + 4\sin^2\theta + 4\cos^2\theta = 5$

$3\sin^2\theta + 4 = 5$

$\sin^2\theta = \frac{1}{3}$

$$\begin{aligned} &= \frac{\frac{3}{\sqrt{2}} + \frac{1}{\sqrt{2}}}{\sqrt{2} - \sqrt{2}} = \frac{2\sqrt{2}}{2 - \sqrt{2}} \\ &= \frac{2}{\sqrt{2} - 1} \\ &= 2(\sqrt{2} + 1) \end{aligned}$$

$\sin\theta = \frac{1}{\sqrt{3}} \rightarrow p$
 $\sqrt{3} \rightarrow H$

$B = \sqrt{3^2 - 1^2} = \sqrt{2}$

132. If $5\sin^2\theta = 3(1 + \cos\theta)$, $0^\circ < \theta < 90^\circ$, then the value of $\operatorname{cosec}\theta + \cot\theta$ is:
यदि $5\sin^2\theta = 3(1 + \cos\theta)$, $0^\circ < \theta < 90^\circ$ है, तो $\operatorname{cosec}\theta + \cot\theta$ का मान ज्ञात करें।

[A] $\sqrt{\frac{7}{3}}$

[B] $\frac{5}{\sqrt{21}}$

[C] $\frac{4}{\sqrt{21}}$

[D] $\sqrt{\frac{3}{7}}$

$$= \frac{5}{\sqrt{21}} + \frac{2}{\sqrt{21}} = \frac{7}{\sqrt{21}} = \frac{\sqrt{7}}{\sqrt{3}}$$

$$\div \sqrt{7}$$

$$\cancel{5(1+\cos\theta)(1-\cos\theta)} = \cancel{3(1+\cos\theta)}$$

$$1 - \cos\theta = \frac{3}{5}$$

$$\cos\theta = \frac{2}{5} \rightarrow \theta$$

$$\sqrt{21} \rightarrow p$$

133. If $4\tan^2\theta = 5(1 + \sec\theta)$, $0^\circ < \theta < 90^\circ$, then find $(\sqrt{65}\cot\theta + \frac{9}{\sqrt{65}}\sin\theta + 9\cos\theta)$?

यदि $4\tan^2\theta = 5(1 + \sec\theta)$, $0^\circ < \theta < 90^\circ$, तो $(\sqrt{65}\cot\theta + \frac{9}{\sqrt{65}}\sin\theta + 9\cos\theta)$ ज्ञात कीजिए?

[A] 9

[B] $4\sqrt{65} - 3$

[C] 5

[D] $2\sqrt{65} + 1$

$$= \cancel{\sqrt{65} \times \frac{4}{\sqrt{65}}} + \cancel{\frac{9}{\sqrt{65}} \times \frac{\sqrt{65}}{9}} + \cancel{9 \times \frac{4}{9}}$$

$$= 4 + 1 + 4$$

$$4 \cdot (\sec\theta + 1)(\sec\theta - 1) = 5(1 + \sec\theta)$$

$$\sec\theta - 1 = \frac{5}{4}$$

$$\sec\theta = \frac{9}{4} \rightarrow H$$

$$\sqrt{9^2 - 4^2} = \sqrt{65} \rightarrow P$$

134. If $\frac{\sin^2 \theta}{\tan^2 \theta - \sin^2 \theta} = 5$, θ is an acute angle, then the value of $\frac{24\sin^2 \theta - 15\sec^2 \theta}{6\operatorname{cosec}^2 \theta - 7\cot^2 \theta}$ is:

यदि $\frac{\sin^2 \theta}{\tan^2 \theta - \sin^2 \theta} = 5$ है, θ न्यून कोण है, तो $\frac{24\sin^2 \theta - 15\sec^2 \theta}{6\operatorname{cosec}^2 \theta - 7\cot^2 \theta}$ का मान ज्ञात करें।

SSC CGL 2020 PRE

[A] 2

[C] 14

[B] -14

[D] -2

$$\frac{24 \times \frac{1}{6} - 15 \times \frac{6}{5}}{6 \times 6 - 7 \times 5}$$

$$\frac{\sin^2 \theta}{\tan^2 \theta - \sin^2 \theta} = 5$$

$$\frac{\sin^2 \theta}{6} = 5$$

$$\frac{\sin^2 \theta}{1} = \sqrt{5} \rightarrow B$$

$$\sqrt{6} = 4$$

$$= \frac{4 - 18}{1}$$

$$= -14$$

136. **Solve the following equation/निम्न समीकरण का मान ज्ञात करें।**

$2\sqrt{3}\sin^2\theta + \cos\theta - \sqrt{3} = 0$ where θ is an acute angle/जहाँ θ न्यून कोण है।

SSC CGL 2024 PRE

☒ [A] 30°

[B] 45°

[C] 60°

[D] 15°

$\theta = 30^\circ$

$$2\sqrt{3}\sin^2\theta + \cos\theta - \sqrt{3} = 0$$

$$2\sqrt{3} \times \frac{1}{4} + \frac{\sqrt{3}}{2} - \sqrt{3}$$

$$\sqrt{3} - \sqrt{3} = 0$$

Trigonometry Ratio Table

Angle (in Degrees)	0°	30°	45°	60°	90°
Angle (in Radians)	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
Sin	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
Cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
Tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not Defined
Cot	Not Defined	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0
Sec	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not Defined
Cosec	Not Defined	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1

135. If $3\cos\theta = 2\sin^2\theta, 0^\circ < \theta < 90^\circ$, then what is the value of $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$

यदि $3\cos\theta = 2\sin^2\theta, 0^\circ < \theta < 90^\circ$ है, तो $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$ का मान ज्ञात करें।

[A] $\frac{17}{3}$

[B] $-\frac{7}{3}$

[C] $-\frac{17}{3}$

[D] $\frac{7}{3}$

$$3 + 4 - \frac{4}{3} = \frac{17}{3}$$

$$3\cos\theta = 2\sin^2\theta$$

$$\cos\theta = \frac{2}{3}$$

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

$$2 \times \frac{3}{4}$$

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

135. If $3\cos\theta = 2\sin^2\theta, 0^\circ < \theta < 90^\circ$, then what is the value of $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$

यदि $3\cos\theta = 2\sin^2\theta, 0^\circ < \theta < 90^\circ$ है, तो $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$ का मान ज्ञात करें।

[A] $\frac{17}{3}$

[B] $-\frac{7}{3}$

[C] $-\frac{17}{3}$

[D] $\frac{7}{3}$

$$3 + 4 - \frac{4}{3} = \frac{17}{3}$$

$$3\cos\theta = 2\sin^2\theta$$

$$3\cos\theta = 2(1 - \cos^2\theta)$$

$$2\cos^2\theta + 3\cos\theta - 2 = 0$$

$$\cos\theta = -\frac{4}{2} \text{ or } \frac{1}{2}$$

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


$$x^2 + 7x + 10 = 0$$

$$\underline{x^2 + 5x} + \underline{2x + 10} = 0$$

$$x \cdot (x+5) + 2(x+5) = 0$$

$$(x+5)(x+2) = 0$$

$$\left. \begin{aligned} \Rightarrow x+5=0 &\Rightarrow x=-5 \\ \Rightarrow x+2=0 &\Rightarrow x=-2 \end{aligned} \right\}$$


$$1 \cdot x^2 + 7x + 10 = 0$$

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

सुग्रा $\rightarrow +10$

add $\rightarrow +7$



$$3x^2 - 10x + 8 = 0$$

$$x = +\frac{6}{3}, +\frac{4}{3} = 2, \frac{4}{3}$$

गुणा $\rightarrow 24$

add $\rightarrow -10$



$$4x^2 + 13x - 12 = 0$$

$$x = -\frac{16}{4}, +\frac{3}{4}$$

$$= -4, \frac{3}{4}$$

गुणा $\rightarrow -48$

add $\rightarrow 13$

137. If $14\sin^2\theta + 3\sin\theta - 5 = 0$, $0^\circ < \theta < 90^\circ$, then the value of $\frac{\sec 2\theta + \cot 2\theta}{\operatorname{cosec} 2\theta + \tan 2\theta}$ is:

यदि $14\sin^2\theta + 3\sin\theta - 5 = 0$, $0^\circ < \theta < 90^\circ$ है, तो $\frac{\sec 2\theta + \cot 2\theta}{\operatorname{cosec} 2\theta + \tan 2\theta}$ का मान क्या होगा?

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

[B] $\frac{2\sqrt{3}+1}{3}$

[C] $\frac{2(1+\sqrt{3})}{5}$

[D] $\frac{1+2\sqrt{3}}{5}$

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

$$\theta = 30^\circ$$

$$\frac{14}{4} + \frac{3}{2} - 5$$

$$\begin{aligned} & 5 - 5 \\ & = 0 \end{aligned}$$

$$= \frac{2\sqrt{3}+1}{\frac{5}{\sqrt{3}}}$$

138. If $\frac{\sin^2 \theta}{\cos^2 \theta - 3\cos \theta + 2} = 1$, θ lies in the first quadrant, then the value of $\frac{\tan^2 \frac{\theta}{2} + \sin^2 \frac{\theta}{2}}{\tan \theta + \sin \theta}$ is.

यदि $\frac{\sin^2 \theta}{\cos^2 \theta - 3\cos \theta + 2} = 1$, θ पहले चतुर्थांश में है, तो $\frac{\tan^2 \frac{\theta}{2} + \sin^2 \frac{\theta}{2}}{\tan \theta + \sin \theta}$ का मान है?

[A] $\frac{2\sqrt{3}}{27}$
 [C] $\frac{2\sqrt{3}}{9}$

[B] $\frac{5\sqrt{3}}{27}$
 [D] $\frac{7\sqrt{3}}{54}$

$$\frac{\frac{1}{3} + \frac{1}{4}}{\frac{\sqrt{3} + \sqrt{3}}{2}} = \frac{\frac{7}{12}}{\frac{2\sqrt{3}}{2}} = \frac{7}{12\sqrt{3}}$$

$$\sin^2 \theta = \cos^2 \theta - 3\cos \theta + 2$$

$$= \frac{7}{12\sqrt{3}}$$

but
 $\theta = 60^\circ$

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

139. If $11\sin^2\theta - \cos^2\theta + 4\sin\theta - 4 = 0, 0^\circ < \theta < 90^\circ$, then what is the value of $\frac{\cot 2\theta + \cos 2\theta}{\sec 2\theta - \tan 2\theta}$?

यदि $11\sin^2\theta - \cos^2\theta + 4\sin\theta - 4 = 0, 0^\circ < \theta < 90^\circ$, तो $\frac{\cot 2\theta + \cos 2\theta}{\sec 2\theta - \tan 2\theta}$ का मान क्या है?

[A] $\frac{12+7\sqrt{3}}{6}$

[B] $\frac{12+5\sqrt{3}}{3}$

[C] $\frac{10+5\sqrt{3}}{3}$

[D] $\frac{10+7\sqrt{3}}{6}$

put $\theta = 30^\circ$

$$\frac{11}{4} - \frac{3}{4} + 2 - 4$$

$$4 - 4 = 0$$

140. If $5 \sin^2 \theta + 14 \cos \theta = 13$, $0^\circ < \theta < 90^\circ$, then what is the value of $\frac{\sec \theta + \cot \theta}{\operatorname{cosec} \theta + \tan \theta}$?

यदि $5 \sin^2 \theta + 14 \cos \theta = 13$, $0^\circ < \theta < 90^\circ$ है, तो $\frac{\sec \theta + \cot \theta}{\operatorname{cosec} \theta + \tan \theta}$ का मान क्या होगा?

SSC CGL 2023 PRE

- [A] $\frac{9}{8}$
[C] $\frac{21}{28}$

- [B] $\frac{31}{29}$
[D] $\frac{32}{27}$

$$\frac{\frac{5}{4} + \frac{4}{3}}{\frac{5}{3} + \frac{3}{4}} = \frac{31}{29}$$

$$5C^2 - 14C + 8 = 0$$

$$5(1 - C^2) + 14C = 13$$

$$5 - 5C^2 + 14C = 13$$

$$680 = \cancel{\frac{+10}{5}} + \frac{4}{5}$$

$$680 = \frac{4}{5} \rightarrow B$$

$$5 \rightarrow H$$

$$3 \rightarrow P$$

$$\text{सुपा} \rightarrow 40$$

$$\text{add} \rightarrow -14$$

141. If $2 \sin \theta + 15 \cos^2 \theta = 7$, $0^\circ < \theta < 90^\circ$, then $\tan \theta + \cos \theta + \sec \theta = ?$

यदि $2 \sin \theta + 15 \cos^2 \theta = 7$, $0^\circ < \theta < 90^\circ$ है, तो $\tan \theta + \cos \theta + \sec \theta$ का मान ज्ञात कीजिए।

[A] $3\frac{4}{5}$
[C] $3\frac{3}{5}$

[B] 3
[D] 4

$$2S + 15(1 - S^2) = 7$$

X $\rightarrow$ -120
odd $\rightarrow$ -2

$$15S^2 - 2S - 8 = 0$$

$$\sin \theta = \cancel{\frac{-10}{15}} \text{ and } \frac{+12}{15}$$

$$\sin \theta = \frac{4}{5} \rightarrow P$$

$$5 \rightarrow H$$

$$3 \rightarrow B$$

142. If $4 - 6\cos^2 \theta - \sin \theta = 0$, $0^\circ < \theta < 90^\circ$, then the value of $\cot \theta + \tan \theta$:

यदि $4 - 6\cos^2 \theta - \sin \theta = 0$, $0^\circ < \theta < 90^\circ$ है, तो $\cot \theta + \tan \theta$ का मान है:

[A] $9\sqrt{2}/5$

[B] $9/2\sqrt{5}$

[C] $3\sqrt{2}/5$

[D] $3/2\sqrt{5}$

$$= \frac{\sqrt{5}}{2} + \frac{2}{\sqrt{5}} = \frac{9}{2\sqrt{5}}$$

$$4 - 6(1 - S^2) - S = 0$$

$$6S^2 - S - 2 = 0$$

$$\sin \theta = \frac{+4}{6}, \frac{-3}{6}$$

$$\sin \theta = \frac{2}{3} \rightarrow P$$

$$\sqrt{5} \rightarrow B$$

13. If θ is an acute angle and $\sin\theta\cos\theta = 2\cos^3\theta - \frac{1}{4}\cos\theta$, then the value of $\sin\theta$ is?

यदि θ एक न्यूनकोण है और $\sin\theta\cos\theta = 2\cos^3\theta - \frac{1}{4}\cos\theta$ है, तो $\sin\theta$ का मान क्या है?

[A] $\frac{\sqrt{15}-1}{8}$

[B] $\frac{\sqrt{15}+1}{4}$

[C] $\frac{\sqrt{15}-1}{4}$

[D] $\frac{\sqrt{15}-1}{2}$

÷ 680

$$\sin\theta = \frac{-4 \pm \sqrt{240}}{16}$$

$$S = 2C^2 - \frac{1}{4}$$

$$4S = 8(1-S^2) - 1$$

$$8S^2 + 4S - 7 = 0$$

$$= \frac{-4 \pm 4\sqrt{15}}{16}$$

$$= \frac{-1 \pm \sqrt{15}}{4}$$

144. If $12\cot^2\theta - 31\operatorname{cosec}\theta + 32 = 0$, $0^\circ < \theta < 90^\circ$, then the values of $\sin\theta$ will be:

यदि $12\cot^2\theta - 31\operatorname{cosec}\theta + 32 = 0$, $0^\circ < \theta < 90^\circ$ है, तो $\sin\theta$ का मान होगा?

SSC CGL 2018 PRE

[A] $\frac{5}{4}, \frac{4}{3}$

[C] $\frac{4}{5}, \frac{3}{4}$

[B] $\frac{2}{3}, \frac{1}{4}$

[D] $\frac{1}{3}, \frac{3}{2}$

$$12(\operatorname{cosec}^2\theta - 1) - 31\operatorname{cosec}\theta + 32 = 0$$

$$12\operatorname{cosec}^2\theta - 31\operatorname{cosec}\theta + 32 = 0$$

गुणा $\rightarrow 240$
 16×15

$$\begin{aligned}\operatorname{cosec}\theta &= +\frac{16}{12}, +\frac{15}{12} \\ &= \frac{4}{3}, \frac{5}{4}\end{aligned}$$

145. What is the value of $\sin\theta + \cos\theta$, if θ satisfies the equation $\cot^2\theta - (\sqrt{3} + 1)\cot\theta + \sqrt{3} = 0$; $0 < \theta < \frac{\pi}{4}$?

यदि θ समीकरण $\cot^2\theta - (\sqrt{3} + 1)\cot\theta + \sqrt{3} = 0$; $0 < \theta < \frac{\pi}{4}$ को संतुष्ट करता है, तो $\sin\theta + \cos\theta$ का मान क्या है?

(CDS 2023)

[A] $\sqrt{2}$

[C] $\frac{\sqrt{3}+1}{2}$

[B] 2

[D] $\frac{\sqrt{3}-1}{2}$

$\theta = 30^\circ$

146. If $3\sec^4\theta + 8 = 10\sec^2\theta$, then the value of $\tan\theta$ can be:

यदि $3\sec^4\theta + 8 = 10\sec^2\theta$ है, तो $\tan\theta$ का मान क्या होगा?

SSC Selection Post (Phase-XII)

[A] $1, \sqrt{3}$

[B] $1, \frac{1}{\sqrt{3}}$

[C] $2, \sqrt{3}$

[D] $2, \frac{1}{\sqrt{3}}$

$$\tan\theta = \sqrt{\sec^2\theta - 1} = 1, \sqrt{\frac{1}{3}}$$

$$3(\sec^2\theta)^2 - 10\sec^2\theta + 8 = 0$$

$$\sec^2\theta = +\frac{6}{3}, +\frac{4}{3} = 2, \frac{4}{3}$$



147. If $\sec\left(90^\circ - \frac{3\theta}{2}\right) = \sqrt{2}$, $0^\circ < \theta < 90^\circ$, then the value of $2\sin\theta + 4\cos 2\theta$ will be:
यदि $\sec\left(90^\circ - \frac{3\theta}{2}\right) = \sqrt{2}$, $0^\circ < \theta < 90^\circ$ है, तो $2\sin\theta + 4\cos 2\theta$ का मान ज्ञात करें।

SSC CHSL 2023 PRE

1+2

[A] 4

[B] 2

[C] 3

[D] 6

$$\sec\left(90^\circ - \frac{3\theta}{2}\right) = \sec 45^\circ$$

$$\frac{3\theta}{2} = 45^\circ$$

$$\theta = 30^\circ$$

148. If $3\tan\theta = 2\sqrt{3}\sin\theta$, $0^\circ < \theta < 90^\circ$, then the value of $\frac{3}{4} \left(\frac{\operatorname{cosec}^2 2\theta + \cot^2 2\theta}{\sin^2 \theta + \tan^2 2\theta} \right)$

यदि $3\tan\theta = 2\sqrt{3}\sin\theta$, $0^\circ < \theta < 90^\circ$ है, तो $\frac{3}{4} \left(\frac{\operatorname{cosec}^2 2\theta + \cot^2 2\theta}{\sin^2 \theta + \tan^2 2\theta} \right)$ का मान ज्ञात करें।

SSC CGL 2020 MAINS

[A] $\frac{5}{13}$
[C] $\frac{7}{13}$

[B] $\frac{3}{13}$
[D] $\frac{1}{13}$

$$3 \frac{\cancel{\sin\theta}}{\cancel{\cos\theta}} = 2\sqrt{3} \frac{\cancel{\sin\theta}}{\cancel{\cos\theta}}$$

$$\sec\theta = \frac{2}{\sqrt{3}}$$

$$\Rightarrow \theta = 30^\circ$$

149. If $\cot\theta = \frac{1}{\sqrt{3}}$ and $(0^\circ < \theta < 90^\circ)$ then find the value of: $\frac{2-\sin^2\theta}{1+\cos^2\theta} + (\operatorname{cosec}2\theta + \sec2\theta)$. Find the value.

यदि $\cot\theta = \frac{1}{\sqrt{3}}$ ($0^\circ < \theta < 90^\circ$) है, तो $\frac{2-\sin^2\theta}{1+\cos^2\theta} + (\operatorname{cosec}2\theta + \sec2\theta)$ का मान ज्ञात कीजिए।

RRB TECHNICIAN GRADE-3, 2025

[A] $\frac{11}{3}$
[C] $\frac{19}{3}$

[B] $\frac{17}{3}$
[D] $\frac{29}{3}$

$$\theta = 60^\circ$$

150. If $4 \sin^2(2x-10)^\circ = 3$, $0 \leq (2x-10) \leq 90$, then find the value of $\frac{\sin^4(x-5)^\circ + \cos^4(x-5)^\circ}{1-2\sin^2(3x-15)^\circ \cos^2(3x-15)^\circ}$.

यदि $4 \sin^2(2x-10)^\circ = 3$, $0 \leq (2x-10) \leq 90$ है, तो $\frac{\sin^4(x-5)^\circ + \cos^4(x-5)^\circ}{1-2\sin^2(3x-15)^\circ \cos^2(3x-15)^\circ}$ का मान ज्ञात करें।

[A] 1

[B] $\frac{5}{8}$

[C] $-\frac{5}{8}$

[D] -1

$$\frac{\frac{1}{16} + \frac{9}{16}}{1-0}$$

$$= \frac{5}{8}$$

$$\left(\frac{\sqrt{3}}{2}\right)^2$$

$$\sin(2x-10)^\circ = \frac{\sqrt{3}}{2}$$

$\downarrow$
 60°

$$2x = 35^\circ$$

151. If $P \sin 60^\circ = Q \operatorname{cosec} 45^\circ$, then find $\frac{P^2 + Q^2}{P^2 - Q^2}$?

यदि $P \sin 60^\circ = Q \operatorname{cosec} 45^\circ$, तो $\frac{P^2 + Q^2}{P^2 - Q^2}$ ज्ञात कीजिए?

(SSC SELECTION POST XII GRADUATE LEVEL 2024)

[A] $11/7$

[B] $11/5 = \frac{8+3}{8-3}$

[C] $5/11$

[D] $7/11$

$$P \times \frac{\sqrt{3}}{2} = Q \times \sqrt{2}$$

$$\frac{P}{Q} = \frac{2\sqrt{2}}{\sqrt{3}}$$