

106. If $3\cos^2\theta + 7\sin^2\theta = 6$, then find the value of $\sec\theta$, given that θ is an acute angle.

यदि $3\cos^2\theta + 7\sin^2\theta = 6$ है, तो $\sec\theta$ का मान ज्ञात कीजिए, जबकि θ एक न्यून कोण है।

RRB GROUP-D 2026

[A] 1

[B] 3

[C] 0

[D] 2

$= \sec 60^\circ = 2$

$$3\cos^2\theta + 3\sin^2\theta + 4\sin^2\theta = 6$$

$$3 + 4\sin^2\theta = 6$$

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

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



107. 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] $4\sqrt{2}$

H.W

108. 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] $\sqrt{\frac{3}{7}}$

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

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

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

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

$$\sqrt{5^2 - 2^2} = \sqrt{21}$$

$$7 = \sqrt{7} \times \sqrt{7}$$

109. 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

$$\frac{4 \times \frac{1}{6} - 15 \times \frac{6}{5}}{6 \times 6 - 7 \times 5} = \frac{-14}{1}$$

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

$$\cot^2 \theta = 5$$

$$\cot \theta = \sqrt{5} = \frac{p}{1} = p$$

$$H = \sqrt{6}$$

113. 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] $\frac{32}{27}$

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

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

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

$$= \frac{31}{29}$$

$$\sqrt{101} = 40$$

$$\text{odd} = -14$$

$$+ \frac{4}{5}, + \frac{10}{5}$$

$$680 = \frac{4}{5} \times 2$$

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

$$5 \rightarrow H$$

$$3 \rightarrow P$$

$$-1 \leq \sin \theta \text{ या } \cos \theta \leq +1$$

$$-\infty < \tan \theta \text{ या } \cot \theta < +\infty$$



110. 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] $\frac{7}{3}$

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

$3C = 2(1 - C^2)$

$2C^2 + 3C - 2 = 0$

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

$\Rightarrow \theta = 60^\circ$

111. 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] $\frac{10+7\sqrt{3}}{6}$

$$\theta = 30^\circ$$

$$\frac{11}{4} - \frac{3}{4} + 2 - 4 = 0$$

112. If $\frac{(\sin^2 \theta - 3\sin \theta + 2)}{\cos^2 \theta} = 1$, where $0^\circ < \theta < 90^\circ$, then the value of $\left(\cot \frac{3}{2}\theta + \sin 3\theta\right)$ is:
यदि $\frac{(\sin^2 \theta - 3\sin \theta + 2)}{\cos^2 \theta} = 1$ है, जहां $0^\circ < \theta < 90^\circ$ है, तो $\left(\cot \frac{3}{2}\theta + \sin 3\theta\right)$ का मान ज्ञात कीजिए।

[A] -1

[B] 1

[C] 2

[D] 0

H.W

114. If $6 - 4\sin^2\theta = 7\sin\theta \cdot \cos\theta$ then find $\cot\theta = ?$

यदि $6 - 4\sin^2\theta = 7\sin\theta \cdot \cos\theta$ तो $\cot\theta$ ज्ञात कीजिए?

~~[A]~~ $\frac{2}{3}$ $\div \sin^2\theta$
[C] $\frac{1}{3}$

[B] $\frac{3}{4}$
[D] $\frac{3}{2}$

$$= \frac{\cos\theta}{\sin\theta}$$

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

$$= \frac{2}{3}, \frac{1}{2}$$

$$6\sec^2\theta - 4 = 7\cot\theta$$

$$6(1 + \cot^2\theta) - 4 = 7\cot\theta$$

$$\cot^2\theta - 7\cot\theta + 2 = 0$$

115. 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] $2, \frac{1}{\sqrt{3}}$

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

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

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

$$= \sqrt{\sec^2\theta - 1}$$

116. If $16 \sec^2 \theta - 40 \sec \theta + 25 = 0$ and θ is an acute angle, then what will be the value of $\tan \theta$?

यदि $16 \sec^2 \theta - 40 \sec \theta + 25 = 0$ और θ , न्यून कोण है, तो $\tan \theta$ का मान कितना होगा?

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

[B] $\frac{3}{4}$
[D] $\frac{3}{5}$

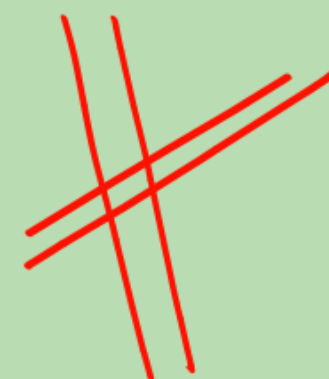
$$(4 \sec \theta)^2 - 2 \times 4 \sec \theta \times 5 + 5^2 = 0$$

$$(4 \sec \theta - 5)^2 = 0$$

$$4 \sec \theta - 5 = 0$$

$$\sec \theta = \frac{5}{4}$$
$$\frac{1}{\cos \theta} = \frac{5}{4}$$
$$\cos \theta = \frac{4}{5}$$
$$\sin \theta = \frac{3}{5}$$
$$\tan \theta = \frac{3}{4}$$

Trigo
Table



117. If $\cos \theta = \frac{1}{2}$, then $7\sec^2 \theta + 3\tan^2 \theta - 9$ equals is:

यदि $\cos \theta = \frac{1}{2}$ है, तो $7\sec^2 \theta + 3\tan^2 \theta - 9$ किसके बराबर है?

[A] 31 $= 60^\circ$

[B] 9

[C] 14

[D] 28

$$\Rightarrow \theta = 60^\circ$$

$$28 + 9 - 9$$

118. 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] $\frac{1}{13}$

$$\frac{3}{4} \times \left(\frac{\frac{4}{3} + \frac{1}{3}}{\frac{1}{4} + 3} \right)$$

$$3 \cdot \frac{S}{C} = 2\sqrt{3} S$$

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

$$\sec\theta = \frac{2}{\sqrt{3}} \Rightarrow \theta = 30^\circ$$

$$\frac{3}{4} \times \frac{5}{3} \times \frac{4}{13}$$

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

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

RRB TECHNICIAN GRADE-3, 2025

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

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

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

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

~~$\frac{2-\sin^2\theta}{1+\cos^2\theta}$~~ + $\left(\frac{4}{3} + 4\right)$

$\cot\theta = \cot 60^\circ$

$\Rightarrow \theta = 60^\circ$

$1 + \frac{16}{3}$

120. 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] $7/11$

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

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

121. Evaluate: $8\sec^2 45^\circ + 20\sin^2 30^\circ + 15\tan 45^\circ$

$8 \sec^2 45^\circ + 20 \sin^2 30^\circ + 15 \tan 45^\circ$ का मान ज्ञात कीजिए।

SSC CHSL 2023 PRE

[A] 43

[B] 28

[C] 36

[D] 42

$16+5+15$

122. If $A = 7.5^\circ$, what is the value of $\frac{32\sqrt{3} \sin 8A + 28 \sec 8A}{13\sqrt{3} \operatorname{cosec} 6A}$?

यदि $A = 7.5^\circ$ है, तो $\frac{32\sqrt{3} \sin 8A + 28 \sec 8A}{13\sqrt{3} \operatorname{cosec} 6A}$ का मान ज्ञात कीजिए।

[RRB GROUP – D 2026]

[A] $\frac{3\sqrt{6}}{5}$

[C] $\frac{5\sqrt{6}}{3}$

$$\frac{\cancel{32} \times \sqrt{3} + 28 \times 2}{13 \times \sqrt{2}}$$

[B] $\frac{2\sqrt{6}}{3}$

[B] $\frac{4\sqrt{6}}{3}$

$$\frac{\cancel{16} \times 3}{\cancel{13} \sqrt{6}} = \frac{3 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{4 \times \sqrt{6}}{3}$$

123. The value of $\frac{\operatorname{cosec}^2 30^\circ \sin^2 45^\circ + \sec^2 60^\circ}{\tan 60^\circ \operatorname{cosec}^2 45^\circ - \sec^2 60^\circ \tan 45^\circ}$ is:

$\frac{\operatorname{cosec}^2 30^\circ \sin^2 45^\circ + \sec^2 60^\circ}{\tan 60^\circ \operatorname{cosec}^2 45^\circ - \sec^2 60^\circ \tan 45^\circ}$ का मान ज्ञात कीजिए।

[A] $3(2 + \sqrt{3})$

[B] $2(\sqrt{3} - 2)$

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

~~[D] $-3(2 + \sqrt{3})$~~

$$\begin{aligned} & \frac{6}{2\sqrt{3}-4} \\ &= \frac{3}{\sqrt{3}-2} \times \frac{\sqrt{3}+2}{\sqrt{3}+2} \\ &= \frac{3(\sqrt{3}+2)}{1} \end{aligned}$$