

65. The value of $\frac{32}{\sec^2 \theta} - \frac{20}{1+\tan^2 \theta} + 12\sin^2 \theta$ is:

$\frac{32}{\sec^2 \theta} - \frac{20}{1+\tan^2 \theta} + 12\sin^2 \theta$ का मान है:

(SSC SELECTION POST XI 2023)

- | | |
|--------|--------|
| [A] 20 | [B] 32 |
| [C] 24 | [D] 12 |

$$\begin{aligned} &= 32 - 20 + 12 \\ &= 24 \end{aligned}$$

66. $\frac{6}{1+\tan^2\alpha} + \frac{2}{1+\cot^2\alpha} + 4\sin^2\alpha - 1 = ?$

[A] 2 [B] 3
[C] 4 [D] 5

$$= 6C^2 + 6S^2 - 1$$

$$= 6 \times (C^2 + S^2) - 1$$

$$= 6 \times 1 - 1 = 5$$

67. Simplify $\sec^2\alpha \left(1 + \frac{1}{\operatorname{cosec}\alpha}\right) \left(1 - \frac{1}{\operatorname{cosec}\alpha}\right)$.

$\sec^2\alpha \left(1 + \frac{1}{\operatorname{cosec}\alpha}\right) \left(1 - \frac{1}{\operatorname{cosec}\alpha}\right)$ का मान ज्ञात करें।

[A] $\tan^4\alpha$

[B] -1

[C] 1 ✓

[D] $\sin^2\alpha$

$$\sec^2\alpha \cdot \operatorname{cosec}^2\alpha = 1$$

68. Simplify: $\left(1 - \frac{1}{\cos\theta}\right) \left(\frac{1+\sec\theta}{\tan^2\theta}\right)$
 $\left(1 - \frac{1}{\cos\theta}\right) \left(\frac{1+\sec\theta}{\tan^2\theta}\right)$ को सरल करें।
(RRB GROUP-D 2025)

$\sec\theta - 1 = \tan\theta$
 $\rightarrow 1 - \sec\theta = -\tan\theta$

[A] 1

[C] -1

[B] -tanθ

[D] tanθ

$$\begin{aligned}
 & (1 - \sec\theta) \cdot \frac{(1 + \sec\theta)}{\tan^2\theta} \\
 &= \frac{-\cancel{\tan\theta}}{\cancel{\tan\theta}} = -1
 \end{aligned}$$

69. **Simplify:** $\frac{\sin^2 \theta (1 + \cot^2 \theta)}{\sec^2 \theta - 1}$

$\frac{\sin^2 \theta (1 + \cot^2 \theta)}{\sec^2 \theta - 1}$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

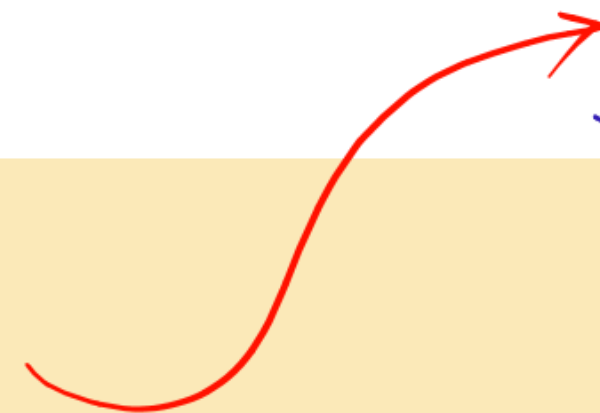
[A] cosec²θ

[C] tan² θ

[B] 1 - cot² θ

[D] cot² θ

~~$\frac{\sin^2 \theta \times \sec^2 \theta}{\tan^2 \theta}$~~



70. If $x = a \sin \theta$ and $y = a \cos \theta$, then find the relation between x , y and a .

यदि $x = a \sin \theta$ और $y = a \cos \theta$ है, तो x , y और के बीच संबंध ज्ञात कीजिए।

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[A] $x^2 - y^2 = -a^2$

[B] $x^2 - y^2 = a^2$

[C] $x^2 + y^2 = -a^2$

[D] $x^2 + y^2 = a^2$

$$\begin{aligned} x^2 + y^2 &= a^2 \sin^2 \theta + a^2 \cos^2 \theta \\ &= a^2 \end{aligned}$$

71. Find the value of $\frac{(3+3\tan^2 A)\cot A}{(1+\cot^2 A)\sec A}$.

$\frac{(3+3\tan^2 A)\cot A}{(1+\cot^2 A)\sec A}$ का मान ज्ञात कीजिए।

- [A] ~~tanA~~
 [C] 3sinA

- [B] ~~sinA~~
 [D] 3tanA

$$\begin{aligned} & \frac{3 \times \cancel{\sec^2 A} \times \cot A}{\cancel{6 \sec^2 A} \times \cancel{\sec A}} \\ &= 3 \times \cancel{\frac{1}{\cancel{c}}} \times \cancel{\frac{s^2}{\cancel{s}}} \times \cancel{\frac{c}{\cancel{s}}} \\ &= 3 \sin A \end{aligned}$$

72. Find the value of $\frac{2\sqrt{\operatorname{cosec}^2 A - 1} \times \sqrt{1 - \cos^2 A}}{\sqrt{1 + \tan^2 A} \times \sqrt[3]{1 - \sin^2 A}}$.

$\frac{2\sqrt{\operatorname{cosec}^2 A - 1} \times \sqrt{1 - \cos^2 A}}{\sqrt{1 + \tan^2 A} \times \sqrt[3]{1 - \sin^2 A}}$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

- [A] $\frac{2}{3}$
- [C] $\frac{2\cos A}{3}$

- [B] $\cos A$
- [D] $\frac{2\sin A}{3}$

$$\begin{aligned} & \frac{2\cancel{\operatorname{cosec} A} \times \cancel{S}}{\cancel{\sec A} \times 3C} \\ &= \frac{2\cos A}{3} \end{aligned}$$



#



73. If A is an acute angle, which of the following is equal to $\frac{\sin A}{1+\cos A}$?

यदि A एक न्यून कोण है, तो निम्नलिखित में से कौन सा $\frac{\sin A}{1+\cos A}$ के बराबर है?

SSC CGL PRE 2024

☒ [A] $\frac{1-\cos A}{\sin A}$

[C] $\frac{1-\sin A}{\cos A}$

[B] $\frac{1+\cos A}{\sin A}$

[D] $\frac{1+\sin A}{\cos A}$

$$\sin^2 A = (1-\cos A)(1+\cos A)$$

$$\cos^2 A = (1-\sin A)(1+\sin A)$$

$$\frac{\sin A}{1+\cos A} \Rightarrow \frac{1-\cos A}{\sin A}$$

74. **Simplify:**/सरलीकृत कीजिए।

$$\frac{\sin A}{1 - \cos A} + \frac{1 - \cos A}{\sin A}$$

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[A] $\sec A$

[C] $\operatorname{cosec} A$

[B] $2\sec A$

☒ [D] $2\operatorname{cosec} A$

$$\frac{1 + \cancel{C}}{S} + \frac{1 - \cancel{C}}{S}$$

$$= \frac{2}{S}$$

$$= 2\operatorname{cosec} A$$

$$\frac{S}{1 - C} \rightarrow \frac{1 + C}{S}$$

75. **Simplify:** /को सरलीकृत कीजिए।

$$\frac{\cos\theta}{1+\sin\theta} + \frac{1+\sin\theta}{\cos\theta}$$

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[A] $2 \operatorname{cosec}\theta$

[B] $2 \sin\theta$

[C] $2 \sec\theta$ ✓

[D] $2 \cos\theta$

76. **Simplify:**/निम्न को सरल कीजिए:

$$\frac{\cos \alpha}{1 - \sin \alpha} - \frac{1 + \sin \alpha}{\cos \alpha}$$

(RRB NTPC 12th LEVEL 2025)

☒ [A] 0

[C] 1

[B] $\sin^2 \alpha$

[D] $\cos^2 \alpha$

~~$$\frac{1 + \sin \alpha}{\cos \alpha} - \frac{1 + \sin \alpha}{\cos \alpha}$$~~

~~$$\frac{\cos \alpha}{1 - \sin \alpha} \rightarrow \frac{1 + \sin \alpha}{\cos \alpha}$$~~

77. If $p = \frac{\sin A}{1 + \cos A}$, then $\frac{\sin A}{1 - \cos A}$ is equal to?
 यदि $p = \frac{\sin A}{1 + \cos A}$, तो $\frac{\sin A}{1 - \cos A}$ किसके बराबर है?

SSC CGL Pre 2024 $= \frac{1}{p}$

[A] $\frac{1}{p}$

[B] $\frac{1}{1-p}$

[C] $\frac{1}{p+1}$

[D] $p-1$

$$p = \frac{S}{1+C} \Rightarrow \frac{1-C}{S}$$

78. The value of $\left[\frac{\cos 50^\circ}{1+\sin 50^\circ} \right] + \left[\frac{1+\sin 50^\circ}{\cos 50^\circ} \right]$ is:
 $\left[\frac{\cos 50^\circ}{1+\sin 50^\circ} \right] + \left[\frac{1+\sin 50^\circ}{\cos 50^\circ} \right]$ का मान ज्ञात कीजिए।
(RRB TECHNICIAN GRADE-3 2024)

- [A] $2 \tan 50^\circ$
 [C] $2 \cot 50^\circ$

- ✓ [B] $2 \sec 50^\circ$
 [D] $2 \operatorname{cosec} 50^\circ$

→ $\frac{1-\cancel{S}}{C} + \frac{1+\cancel{S}}{C}$
 $= \frac{2}{C}$

$\frac{C}{1+S} \Rightarrow \frac{1-S}{C}$

79. If $\frac{\cos\theta}{1-\sin\theta} + \frac{\cos\theta}{1+\sin\theta} = 4$, $0^\circ < \theta < 90^\circ$, then the value of $(\tan\theta + \operatorname{cosec}\theta)$ is:

यदि $\frac{\cos\theta}{1-\sin\theta} + \frac{\cos\theta}{1+\sin\theta} = 4$, $0^\circ < \theta < 90^\circ$ है, तो $(\tan\theta + \operatorname{cosec}\theta)$ का मान होगा-

[A] $5\frac{\sqrt{2}}{2}$ ~~X~~

[B] $5\frac{\sqrt{3}}{3}$ ✓

[C] $4\frac{\sqrt{3}}{3}$

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

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

$$\frac{\cancel{C} \times \cancel{2}}{\cancel{C}^2} = \cancel{4}^2$$

$$\sec\theta = 2$$

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

80. Which of the following option gives the correct expression for y , when $\frac{\cos^2 A}{1 - \sin A} = y$ and $\sin A \neq 1$?

निम्न में से कौन सा विकल्प y के लिए सही व्यंजक देता है, जब $\frac{\cos^2 A}{1 - \sin A} = y$ और $\sin A \neq 1$?

RRB ALP 2024

[A] cosec A

[C] ~~sin A + 1~~

[B] sec A + tan A

[D] cos A + 1

$$\frac{(1-s)(1+s)}{(1-s)} = \cancel{1-s}$$

81. Find the value of the given expression $\frac{\cos A}{1-\tan A} + \frac{\sin^2 A}{\sin A - \cos A} + 2\sin A - \cos A$.

दिए गए व्यंजक का मान ज्ञात कीजिए $\frac{\cos A}{1-\tan A} + \frac{\sin^2 A}{\sin A - \cos A} + 2\sin A - \cos A$.

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[A] $3 \sin A$

[B] $\sin A$

[C] $3 \cos A$

[D] $\cos A$

$$\frac{C}{1-\frac{S}{C}}$$

$$\frac{\frac{C}{C-S}}{C}$$

$$\frac{C^2}{C-S} - \frac{S^2}{C-S}$$

$$= \cancel{C} + S + 2S - \cancel{C}$$



82. If $\sin\theta = x$, then $\frac{\sqrt{1+x}(\tan\theta)}{x} = \text{---}$.

यदि $\sin\theta = x$ है, तो $\frac{\sqrt{1+x}(\tan\theta)}{x}$ का मान ज्ञात कीजिए।

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

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

[B] $\sqrt{1-x}$

☒ [D] $\frac{1}{\sqrt{1-x}}$

$$\sin\theta = \frac{x}{1} \rightarrow \begin{matrix} P \\ H \end{matrix}$$

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

$$= \frac{\sqrt{1+x} \times \cancel{x}}{\cancel{x} \sqrt{1-x^2}}$$

$$= \frac{\sqrt{1+x}}{\sqrt{(1-x)(1+x)}}$$

83. Let $\theta \in (0, \pi/2)$ and $\tan \theta + \cot \theta = 5$ then what is the value of $\sec^2 \theta \csc^2 \theta$
 यदि $\theta \in (0, \pi/2)$ और $\tan \theta + \cot \theta = 5$ दिया गया हो, तो $\sec^2 \theta \csc^2 \theta$ का मान ज्ञात कीजिए।

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[A] (-5)

[C] $(\frac{2}{5})$

[B] $(\frac{1}{5})$

[D] None

$$= \sec^2 \theta \cdot \csc^2 \theta = 5^2$$

$$\tan \theta + \cot \theta = \frac{1}{\sin \theta \cdot \cos \theta} = \sec \theta \cdot \csc \theta$$

$\left(\frac{1 - \cancel{\cos\theta}}{\sin\theta} + \frac{1 + \cancel{\cos\theta}}{\sin\theta} \right) \cdot \left(\frac{1}{\tan\theta + \cot\theta} \right)$ का मान किसके बराबर है?

[A] $\tan \theta$

[B] 1

~~[c]~~ $2\cos\theta$

[D] $2\sin\theta$

$$= \frac{2}{8} \times \cancel{8C}$$
$$= 2680$$
$$\frac{1}{\left(\frac{1}{SC}\right)}$$
~~$$\frac{S}{1+C} \rightleftharpoons \frac{1-C}{S}$$~~

85. **Simplify:** को सरल कीजिए।

$$\frac{\sin A \cdot \tan A}{1 - \cos A} - \frac{\cos A \cdot \cot A}{1 - \sin A}$$

RRB ALP CBT-1 2025

☒ [A] $\sec A - \operatorname{cosec} A$

[B] $\operatorname{cosec} A - \sec A$

[C] $\cos A - \sin A$

[D] $\sin A - \cos A$

$$\frac{S^2}{C \cdot (1 - C)} - \frac{C^2}{(1 - S) \cdot S}$$

$$= \frac{1 + C}{C} - \frac{1 + S}{S}$$

$$= \cancel{\sec A + 1} - (\cancel{\csc A + 1})$$

86. Find the value of $\left[\frac{2\cos A}{(1-\sin A)} + \frac{2\cos A}{(1+\sin A)} \right] \times 3\sqrt{\sec^2 A - 1}$.

$\left[\frac{1}{(1-\sin A)} + \frac{1}{(1+\sin A)} \right] \times 3\sqrt{\sec^2 A - 1}$ का मान ज्ञात करें।

(RRB GROUP-D 2025)

[A] 12 secAtanA

[B] 4 secA

[C] 18 secAtanA

[D] 12 tanA

$$2 \times \frac{2}{\cancel{C^2}} \times 3 \times T$$

12 secA.tanA

87. Simplify: $\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}}$

$\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}}$ को सरल कीजिए।

[A] $2 \cos A$

[B] $2 \sec A$

[C] $2 \operatorname{cosec} A$

[D] $2 \sin A$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$= \frac{1+\cancel{\sin A} + 1-\cancel{\sin A}}{1}$$

$$= 2 \sec A$$

88. Simplify: $\frac{\cot\theta}{\operatorname{cosec}\theta+1} + \frac{\operatorname{cosec}\theta+1}{\cot\theta}$.

$\frac{\cancel{\cot\theta}-1}{\operatorname{cosec}\theta+1} + \frac{\operatorname{cosec}\theta+1}{\cot\theta}$ को सरल कीजिए।

$= \frac{2\cancel{\cot\theta}}{\cot\theta}$

$= 2\sec\theta$

[A] $2\operatorname{cosec}\theta$

[C] $2\sec\theta$

[B] $2\sin\theta$

[D] $2\cos\theta$

$\tan^2\theta = (\sec\theta-1)(\sec\theta+1)$

$\cot^2\theta = (\operatorname{cosec}\theta-1)(\operatorname{cosec}\theta+1)$

$\frac{\cot\theta}{\operatorname{cosec}\theta+1} = \frac{\cancel{\cot\theta}-1}{\cot\theta}$

**89. The value of $(1 + \cot^2\theta)(1 + \cos\theta)(1 - \cos\theta) - (1 - \sin\theta)(1 + \sin\theta)(1 + \tan^2\theta)$:
(θ lies in first quadrant).**

$(1 + \cot^2\theta)(1 + \cos\theta)(1 - \cos\theta) - (1 - \sin\theta)(1 + \sin\theta)(1 + \tan^2\theta)$ का मान क्या है:
(θ पहले चतुर्थांश में स्थित है).

RRB TECHNICIAN GRADE-3, 2024.

RRB ALP 2024

[A] 0 ✓

[C] 2

[B] 1

[D] 4

$$| - | \\ = 0$$

90. Find the value of $2\sec^2 A + 6\operatorname{cosec}^2 A - 2\tan^2 A - 6\cot^2 A$.

$2\sec^2 A + 6\operatorname{cosec}^2 A - 2\tan^2 A - 6\cot^2 A$ का मान ज्ञात कीजिए।

RRB TECHNICIAN GRADE-3 2024

[A] 8

[B] 6

[C] 4

[D] 2

2+6

91. Find the value of $\frac{2\sqrt{\operatorname{cosec}^2 A - 1} \times \sqrt{1 - \cos^2 A}}{\sqrt{1 + \tan^2 A} \times 3\sqrt{1 - \sin^2 A}}$.

$\frac{2\sqrt{\operatorname{cosec}^2 A - 1} \times \sqrt{1 - \cos^2 A}}{\sqrt{1 + \tan^2 A} \times 3\sqrt{1 - \sin^2 A}}$ का मान ज्ञात कीजिए।

RRB GROUP-D 2024

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

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

[B] $\cos A$

[D] $\frac{2\sin A}{3}$

92. $\left(\frac{1}{\cos\theta} - \frac{1}{\sin\theta} \right) + \frac{1}{(\operatorname{cosec}\theta - \cot\theta)} - \frac{1}{(\sec\theta + \tan\theta)} = ?$

[A] $\sec\theta \operatorname{cosec}\theta$

[B] $\sin\theta \tan\theta$

[C] $\operatorname{cosec}\theta \cot\theta$

[D] $\sin\theta \cos\theta$

$$\cancel{\sec\theta} - \cancel{\csc\theta} + \cancel{\sec\theta} + \cot\theta - (\cancel{\sec\theta} + \tan\theta)$$

$$= \cot\theta + \tan\theta$$

93. Simplify: $\frac{(\sin\theta - \cos\theta)(1 + \tan\theta + \cot\theta)}{1 + \sin\theta\cos\theta} + \frac{\sin\theta}{1 + \cos\theta} + \frac{1 + \cos\theta}{\sin\theta}$

निम्न को सरल कीजिए: $\frac{(\sin\theta - \cos\theta)(1 + \tan\theta + \cot\theta)}{1 + \sin\theta\cos\theta} + \frac{\sin\theta}{1 + \cos\theta} + \frac{1 + \cos\theta}{\sin\theta}$

RRB NTPC 12th LEVEL 2024

[A] cosec θ + sec θ

[B] sin θ + sec θ

[C] sin θ + cos θ

[D] tan θ + sec θ

$\frac{1 - \cancel{c}}{s} + \frac{1 + \cancel{c}}{s}$

$\frac{(\cancel{s} - \cancel{c}) \cdot \left(\frac{\cancel{sc} + 1}{\cancel{sc}} \right)}{1 + \cancel{sc}} + \frac{2}{s}$

$\frac{1}{c} + \frac{1}{s}$

यदि $\frac{(\sin\theta - \operatorname{cosec}\theta)(\cos\theta - \sec\theta)}{\tan^2\theta - \sin^2\theta} = r^3$ है तो r बराबर है:

[B] $\tan \theta$

[D] cosec θ sec θ

$$\frac{-\frac{C}{S} \times -\frac{S}{C}}{T \times S}$$

$$= \frac{\cancel{SC}}{\cancel{T^2} \times \cancel{S^2}} = 6/0 \cdot 6/0 = 6/0^3 = 2^3$$

$$= -\frac{s^2}{c}$$

95. **Simplify:** को सरलीकृत कीजिए।

$$\frac{\cot\theta - \cos\theta}{\cot\theta + \cos\theta}$$

RRB NTPC GRADUATE LEVEL CBT-1 2025

[A] $\frac{\sec\theta - 1}{\sec\theta + 1}$

[C] $\frac{\sec\theta + 1}{\sec\theta - 1}$

[B] $\frac{\operatorname{cosec}\theta - 1}{\operatorname{cosec}\theta + 1}$

[D] $\frac{\operatorname{cosec}\theta + 1}{\operatorname{cosec}\theta - 1}$

$$\begin{aligned} & \frac{\cancel{\cot\theta} - \cancel{\cos\theta}}{\cancel{\cot\theta} + \cancel{\cos\theta}} \\ &= \frac{\cancel{\cot\theta} - 1}{\cancel{\cot\theta} + 1} \end{aligned}$$



$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sqrt{\frac{1+\sin\theta}{1-\sin\theta} \times \frac{1+\sin\theta}{1+\sin\theta}} = \frac{1+\sin\theta}{\cos\theta} = \sec\theta + \tan\theta$$



96. **Simplify the given expression.**

दिए गए व्यंजक को सरल कीजिए।

$$\sqrt{\frac{1+\cos P}{1-\cos P}}$$

SSC CHSL 2023 PRE (RRB NTPC 12th LEVEL 2025)

☒ [A] cosec P + cot P

☒ [B] tan P + tan P

[C] sec P – tan P

[D] cosec P – cot P

$$\sqrt{\frac{1+\cos P}{1-\cos P}} = \frac{1+\cos P}{\sin P}$$
$$= \operatorname{cosec} P + \cot P$$

97. What is $(\sec \theta - \tan \theta) - \sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}}$ equal to ?

$(\sec \theta - \tan \theta) - \sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}}$ किसके बराबर है?

(UPSC CDS - II 2025)

[A] 0 ✓

[C] $2\sec \theta$

[B] $2\tan \theta$

[D] $\sin \theta + \cos \theta$



98. If $(1 + \tan^2\theta) + (1 + (\tan^2\theta)^{-1}) = k$, then $\sqrt{k} = ?$

यदि $(1 + \tan^2\theta) + (1 + (\tan^2\theta)^{-1}) = k$ है, तो $\sqrt{k} = ?$

SSC CGL 2020 PRE

[A] cosec θ sec θ

[B] cosec θ cos θ

[C] sin θ cos θ

[D] sin θ sec θ

$$a^{-1} = \frac{1}{a}$$

$$\sec^2\theta + \sec^2\theta = k$$

$$\sqrt{\sec^2\theta \cdot \sec^2\theta} = \sqrt{k}$$

99. **Simplify:**/निम्न को सरल कीजिए:

$$(1 + \cot^2 A) + \left(1 + \frac{1}{\cot^2 A}\right)$$

(RRB NTPC 12th LEVEL 2025)

[A] $\tan^2 A$

[B] $\cot^2 A$

[C] $\sin^2 A \cos^2 A$

~~[D] $\operatorname{cosec}^2 A \sec^2 A$~~

100. The value of $\tan^2\theta + \cot^2\theta - \sec^2\theta \operatorname{cosec}^2\theta$ is equal to:

$\tan^2\theta + \cot^2\theta - (\sec^2\theta \operatorname{cosec}^2\theta)$ का मान बराबर है:

SSC CGL MAINS 2020

[A] -1

[B] -2

[C] 1

[D] 0

$$\tan^2\theta + \cot^2\theta - \sec^2\theta - \sec^2\theta$$

-1-1

101. The value of $(\sec\theta - \tan\theta)^2 (1 + \sin\theta)^2 \div \cos^2\theta$ is.

$(\sec\theta - \tan\theta)^2 (1 + \sin\theta)^2 \div \cos^2\theta$ का मान ज्ञात कीजिए।

[A] -2

[B] 2

[C] 0

[D] 1

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

$$= 1^2$$

$$= (\sec\theta + \tan\theta)^2$$

X