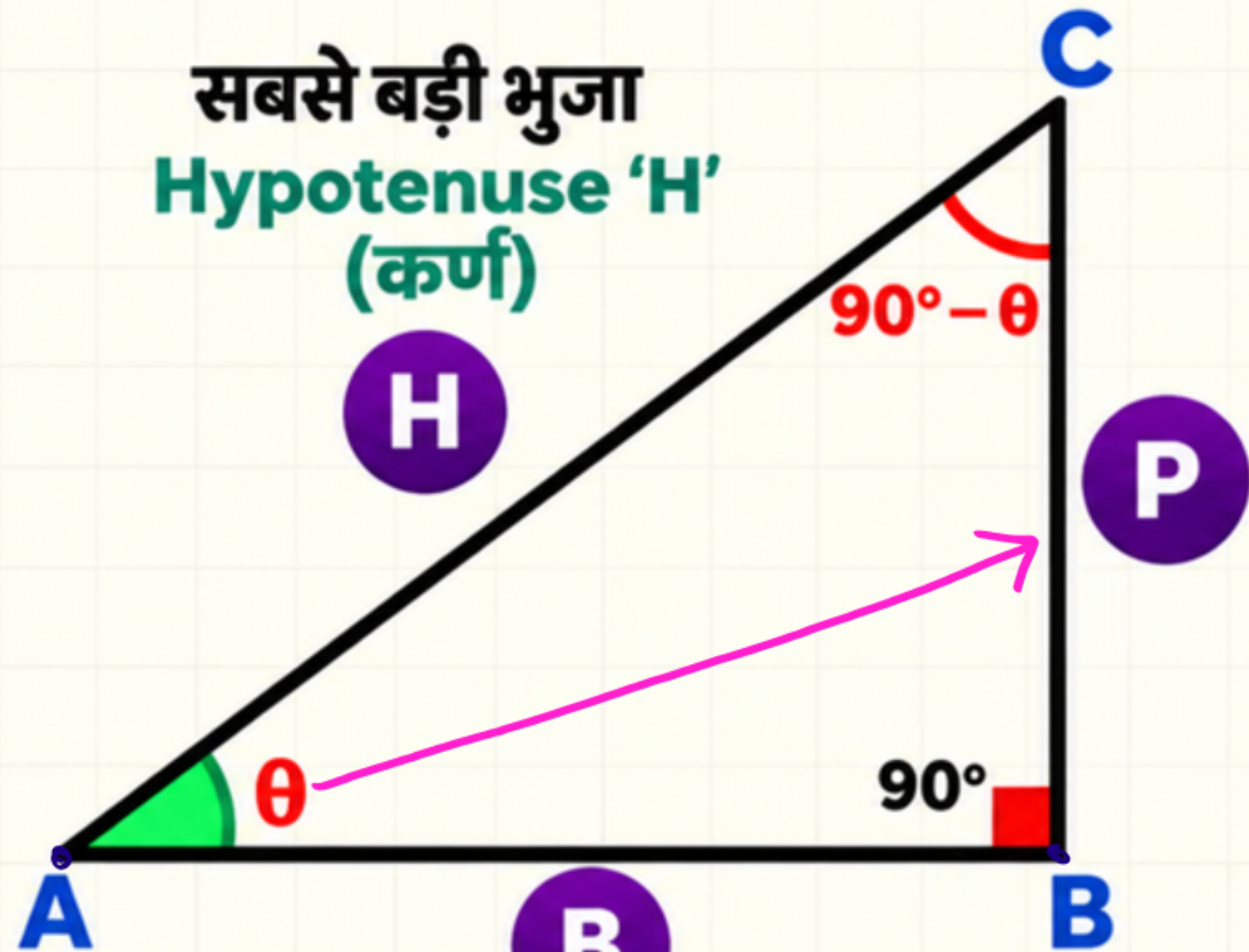


Trigonometry (त्रिकोणमिति)



सबसे बड़ी भुजा
Hypotenuse 'H'
(कर्ण)

A, C → acute angle
 $A + C = 90^\circ$

समकोण
 $\triangle ABC$

$$H^2 = P^2 + B^2 \rightarrow H = \sqrt{P^2 + B^2} \checkmark$$

$$P^2 = H^2 - B^2 \rightarrow P = \sqrt{H^2 - B^2} \checkmark$$

$$B^2 = H^2 - P^2 \rightarrow B = \sqrt{H^2 - P^2} \checkmark$$

$$a^2 + b^2 = c^2$$

A

$$b^2 + b^2 = \sqrt{c^2} \quad (x+y)^2$$

Some Pythagorean Triplets

(3, 4, 5) ✓

(5, 12, 13) ✓

(7, 24, 25) ✓

(8, 15, 17) ✓

(9, 40, 41) ✓

(11, 60, 61) ✓

(12, 35, 37) ✓

(13, 84, 85) ✓

(16, 63, 65) ✓

(20, 21, 29) ✓

(20, 99, 101) ✓

(28, 45, 53) ✓

(33, 56, 65) ✓

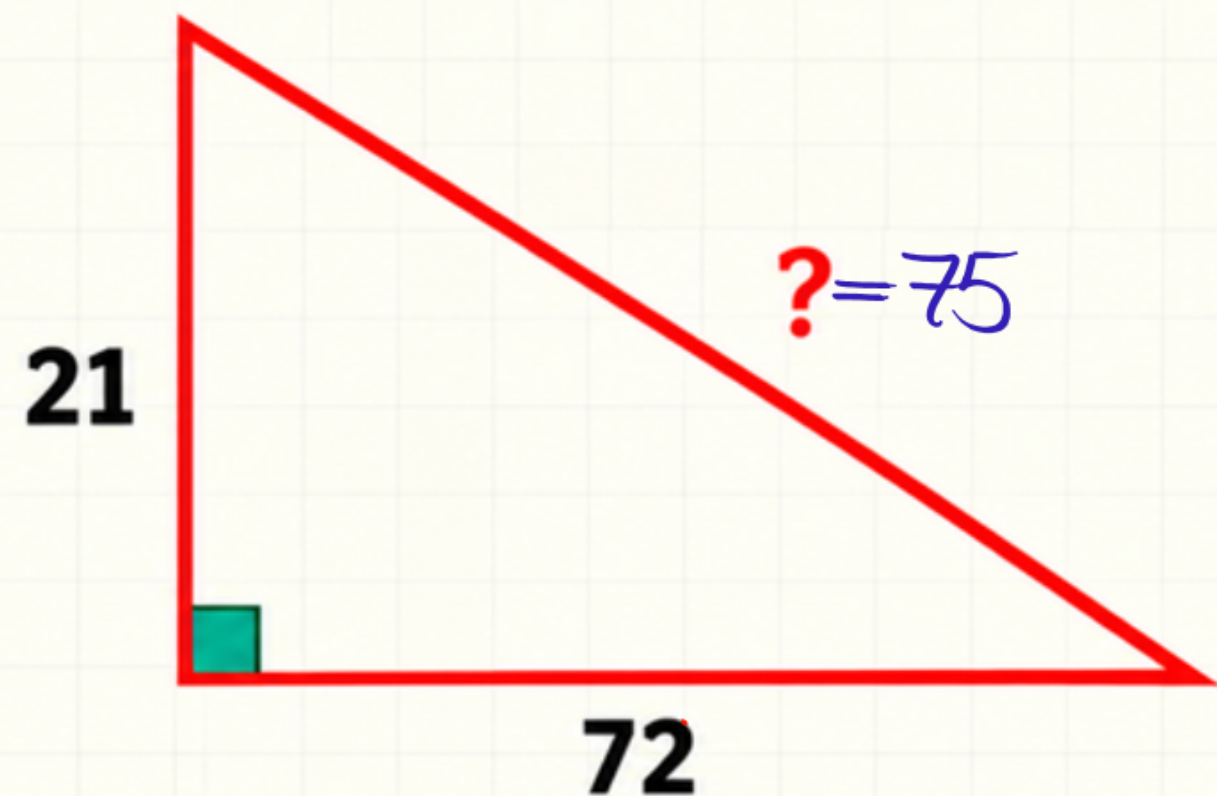
(36, 77, 85) ✓

(39, 80, 89) ✓

(48, 55, 73) ✓

(65, 72, 97) ✓

In a triplet largest side is hypotenuse
(त्रिक में सबसे बड़ी भुजा कर्ण होती है)



÷3

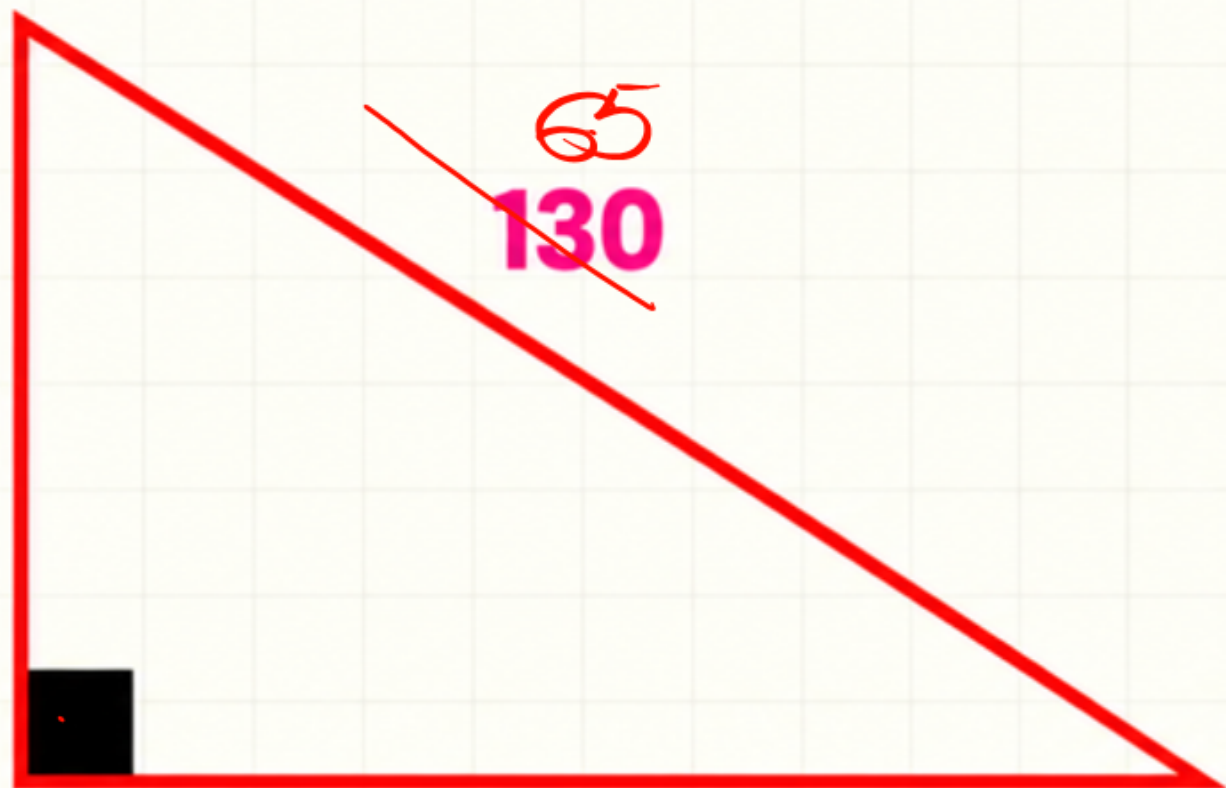
(7, 24, 25) × 3

$$a^2 + b^2 = c^2$$

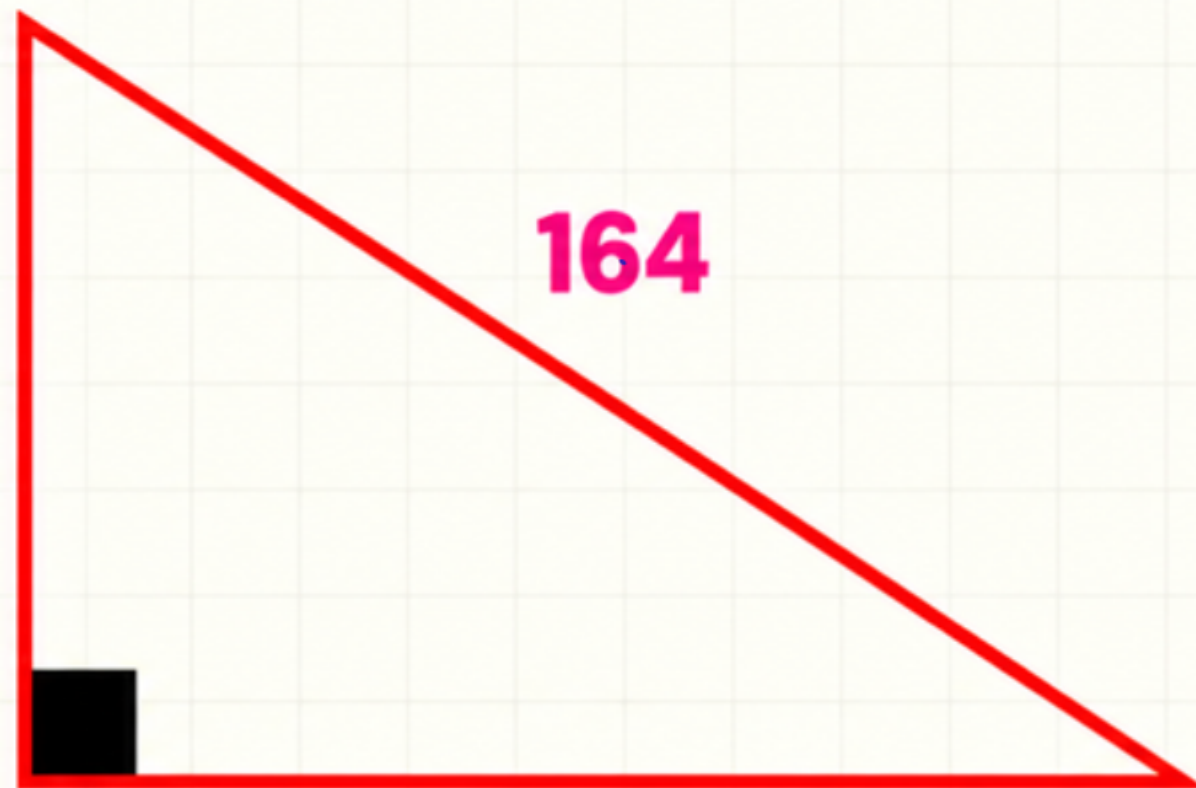


$$\sqrt{b^2 + b^2} = \sqrt{c}$$

$$(x+y)^2$$

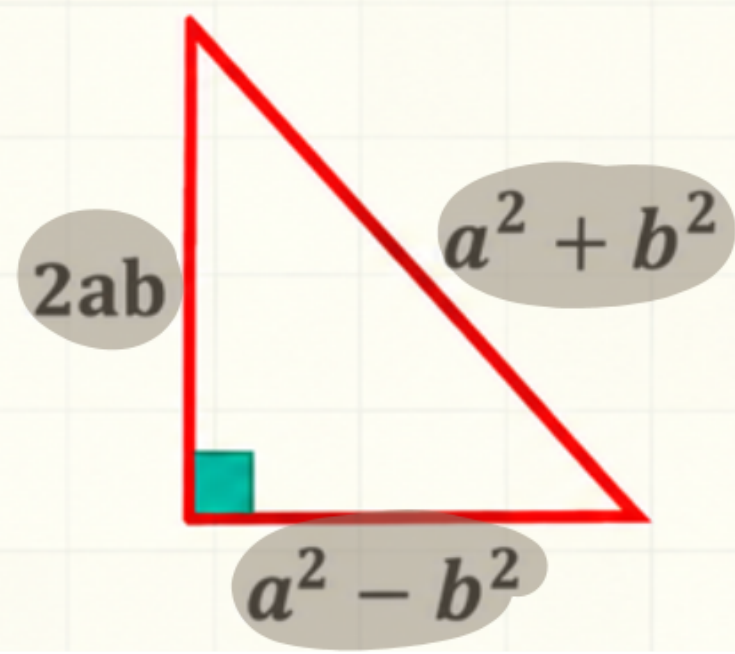


$$36 = ?$$



$$\div 4$$

$$(9, 40, 41)$$



H

$a^2 - b^2, 2ab, a^2 + b^2 \rightarrow$ Triplets

$$x^2 - 1, 2x, x^2 + 1$$

$$4x^2 - y^2, 4xy, 4x^2 + y^2$$

$$a \rightarrow x$$

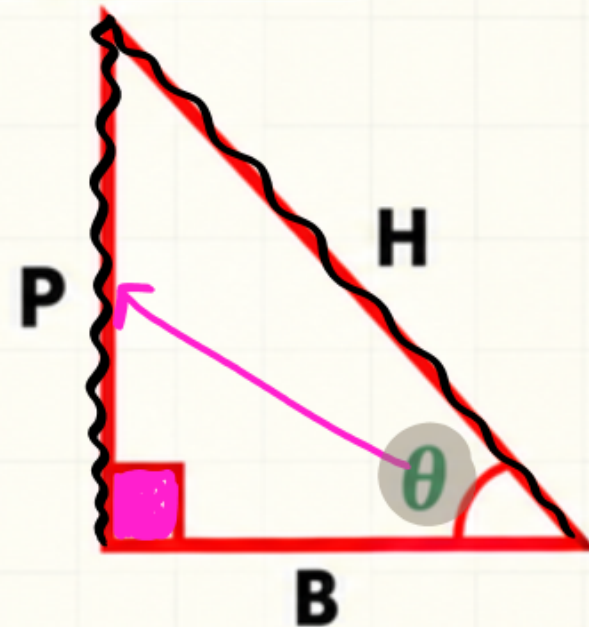
$$b \rightarrow 1$$

$$a \rightarrow 2x$$

$$b \rightarrow 3y$$

TRIGNOMETRIC RATIO:

~~LAL
KKA~~ ~~PPB
HHB~~



$$\sin \theta = \frac{P (\text{लम्ब})}{H (\text{कर्ण})}$$

$$\operatorname{cosec} \theta = \frac{H (\text{कर्ण})}{P (\text{लम्ब})}$$

$$\cos \theta = \frac{B (\text{आधार})}{H (\text{कर्ण})}$$

$$\sec \theta = \frac{H (\text{कर्ण})}{B (\text{आधार})}$$

$$\tan \theta = \frac{P (\text{लम्ब})}{B (\text{आधार})}$$

$$\cot \theta = \frac{B (\text{आधार})}{P (\text{लम्ब})}$$

$$\sin \theta = \frac{1}{\operatorname{cosec} \theta}$$

या $\operatorname{cosec} \theta = \frac{1}{\sin \theta} \rightarrow \sin \theta \times \operatorname{cosec} \theta = 1$

$\sec \theta = \frac{1}{\cos \theta} \rightarrow \cos \theta \times \sec \theta = 1$

$\cot \theta = \frac{1}{\tan \theta} \rightarrow \tan \theta \times \cot \theta = 1$

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\sec \theta}{\operatorname{cosec} \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta} = \frac{\operatorname{cosec} \theta}{\sec \theta}$$

1. In a right-angled triangle, if the lengths of the opposite side and the adjacent side to angle θ are 7 cm and 21 cm, respectively, then what is the value of $\tan\theta$?

एक समकोण त्रिभुज में, यदि कोण θ की सम्मुख भुजा और उसकी आसन्न भुजा की लंबाई क्रमशः 7 cm और 21 cm है, तो $\tan\theta$ का मान कितना होगा?

(RRB NTPC GRADUATE LEVEL CBT-1 2025)

[A] $\frac{1}{3}$
[C] $\frac{2}{21}$

[B] $\frac{1}{7}$
[D] $\frac{1}{21}$

#

$\frac{P}{B} = \frac{7}{21}$

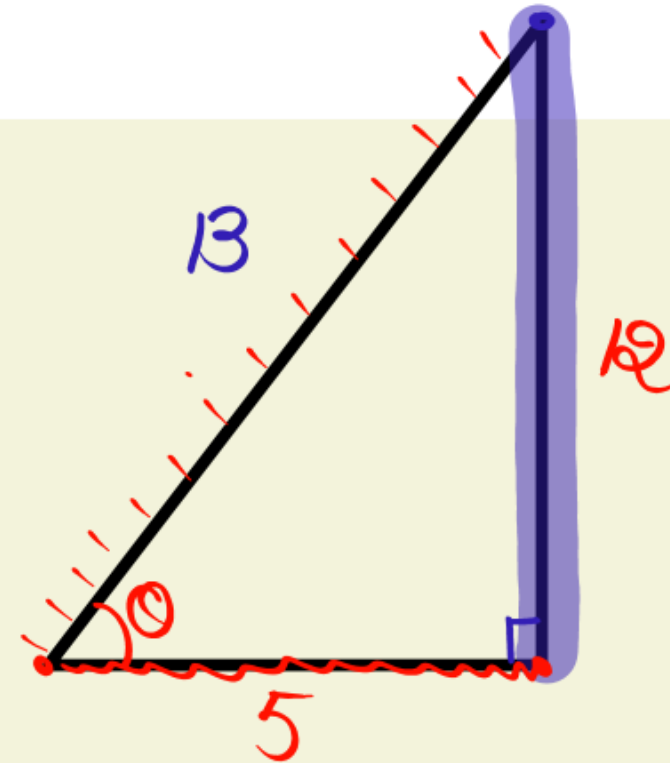
2. A ladder 13 m long leans against a wall. The foot of the ladder is 5 m from the wall. What is $\sin \theta$, where θ is the angle between the ladder and the ground?

13 m लंबी एक सीढ़ी एक दीवार के सहारे टिकी हुई है। सीढ़ी का निचला सिरा दीवार से 5 m की दूरी पर है। $\sin \theta$ का मान क्या है, जहाँ θ सीढ़ी और ज़मीन के बीच का कोण है?

(SSC CHSL MAINS 2025)

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

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



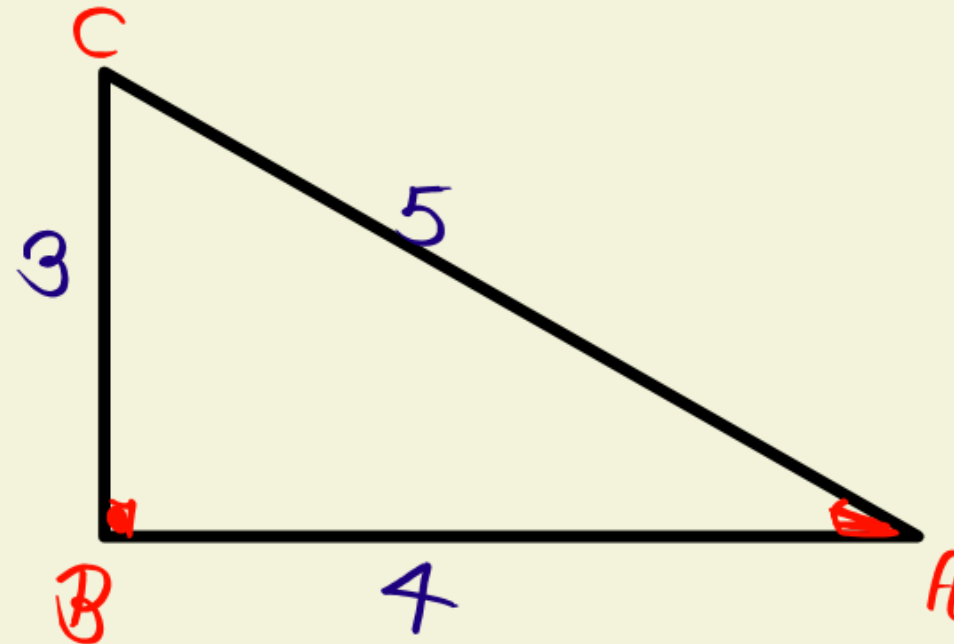
3. In a right-angled triangle ABC, right-angled at B, if $\tan A = \frac{3}{4}$, then find cosec A.
 समकोण त्रिभुज ABC में, जिसका कोण B समकोण है, यदि $\tan A = \frac{3}{4}$ है, तो cosec A ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] $\frac{3}{2}$
 [C] $\frac{5}{2}$

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

$\frac{H}{P} = \frac{5}{3}$



4. If t is an acute angle and $\tan(t) = \frac{3}{7}$, then what is the value of $\operatorname{cosec}(t)$?
 यदि t एक न्यूनकोण है और $\tan(t) = \frac{3}{7}$ है, तो $\operatorname{cosec}(t)$ का मान क्या है?

SSC CHSL PRE 2024

~~[A] $\frac{\sqrt{53}}{7}$~~
~~[C] $\frac{7}{\sqrt{58}}$~~

[B] $\frac{\sqrt{53}}{3}$
 [D] $\frac{\sqrt{58}}{3}$

$$= \frac{H}{P} = \frac{\sqrt{58}}{3}$$

$$\tan(t) = \frac{3}{7} \rightarrow \begin{matrix} P \\ B \end{matrix}$$

$$H = \sqrt{3^2 + 7^2} = \sqrt{58}$$

5. **If $\cos\theta = \frac{8}{17}$, what is the value of $\sin\theta$?**

यदि $\cos\theta = \frac{8}{17}$, तो $\sin\theta$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] $\frac{15}{8}$

[C] $\frac{17}{15}$

[B] $\frac{15}{17}$

[D] $\frac{8}{15}$

$P=15$

$= \frac{15}{17}$

6. If $\operatorname{cosec}\theta = \frac{41}{9}$ and θ is an acute angle, then the value of $5\tan\theta$ will be:
 यदि $\operatorname{cosec}\theta = \frac{41}{9}$ है और θ न्यून कोण है, तो $5\tan\theta$ का मान ज्ञात करें।

(SSC CGL PRE 2023)

[A] $\frac{11}{8}$
 [C] $\frac{7}{8}$

[B] $\frac{13}{4}$
 [D] $\frac{9}{8}$

$= 5 \times \frac{9}{40}$

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

$\operatorname{cosec}\theta = \frac{41}{9} \rightarrow H$
 $9 \rightarrow P$

$40 \rightarrow B$

7. If $\cot \theta = \frac{14}{3}$, then what is the value of $\cos \theta$? ($0^\circ < \theta < 90^\circ$)

यदि $\cot \theta = \frac{14}{3}$ है, तो $\cos \theta$ का मान ज्ञात कीजिए। ($0^\circ < \theta < 90^\circ$)

(RRB GROUP-D 2025)

[A] ~~$\frac{3}{\sqrt{205}}$~~

[C] ~~$\frac{1}{7}$~~

[B] $\frac{14}{\sqrt{205}}$

[D] ~~$\frac{3}{14}$~~

$$\cot \theta = \frac{14}{3} \rightarrow \begin{matrix} B \\ P \end{matrix}$$

$$H = \sqrt{14^2 + 3^2} = \sqrt{205}$$

8. If $\sec\theta = \frac{17}{12}$, then what is the value of $\sin\theta$? ($0^\circ < \theta < 90^\circ$)

यदि $\sec\theta = \frac{17}{12}$ है, तो $\sin\theta$ का मान ज्ञात कीजिए। ($0^\circ < \theta < 90^\circ$)

(RRB GROUP-D 2025)

[A] $\frac{13}{17}$

[C] $\frac{12}{17}$

[B] $\frac{\sqrt{170}}{17}$

[B] $\frac{\sqrt{145}}{17}$

$\frac{P}{H} = \frac{\sqrt{145}}{17}$

$\sec\theta = \frac{17}{12} \rightarrow H$
 $\rightarrow B$

$P = \sqrt{H^2 - B^2}$
 $= \sqrt{17^2 - 12^2} = \sqrt{145}$

9. If $5\cos\theta = 4\sin\theta$, $0^\circ \leq \theta \leq 90^\circ$, then what will be the value of $\sec\theta$.

यदि $5\cos\theta = 4\sin\theta$ और $0^\circ \leq \theta \leq 90^\circ$ है, तो $\sec\theta$ का मान ज्ञात कीजिए।

SSC CHSL 2023 PRE

[A] $\frac{\sqrt{41}}{5}$

[C] $\frac{\sqrt{41}}{16}$

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

[B] $\frac{\sqrt{41}}{4}$

$= \frac{H}{B} = \frac{\sqrt{41}}{4}$

$\frac{680}{8100} = \frac{4}{5}$

$\cot\theta = \frac{4}{5} \rightarrow B$
 $5 \rightarrow P$

$H = \sqrt{5^2 + 4^2} = \sqrt{41}$

10. If $\sin\theta = \frac{3}{5}$, then find $\cos\theta + \tan\theta$.

यदि $\sin\theta = \frac{3}{5}$ है, तो $\cos\theta + \tan\theta$ का मान ज्ञात करें।

(SSC CHSL Mains 2025)

[A] $\frac{9}{4}$
[C] $\frac{4}{3}$

4 → B

[B] $\frac{31}{20}$
[D] $\frac{3}{4}$

$\frac{4}{5} \times \frac{3}{4} = \frac{31}{20}$

11. If θ is an acute angle and $\sin \theta = \frac{43}{47}$, what is the value of $\cos \theta$?
 यदि θ एक न्यूनकोण है और $\sin \theta = \frac{43}{47}$ तो $\cos \theta$ का मान क्या है?

SSC CHSL 2023 PRE

[A] $\frac{43}{6\sqrt{10}}$

[C] $\frac{6\sqrt{10}}{43}$

[B] $\frac{47}{6\sqrt{10}}$

[D] $\frac{6\sqrt{10}}{47}$

$$\begin{aligned} B &= \sqrt{47^2 - 43^2} \\ &= \sqrt{4 \times 90} \\ &= \sqrt{360} \\ &= 6\sqrt{10} \end{aligned}$$

12. If $\cot\theta = 28/45$, then find the value of $(\sin\theta - \cos\theta)$.
 यदि $\cot\theta = 28/45$ है, तो $(\sin\theta - \cos\theta)$ का मान ज्ञात कीजिए

SSC CPO 2024

[A] $45/28$

[C] $28/53$

[B] $7/53$

[D] $17/53$

$$\cot\theta = \frac{28}{45} \rightarrow \theta$$

$$53 \rightarrow H$$

13. If $\sin A = \frac{8}{17}$, then what is the value of $\cot A + \sec A$?

यदि $\sin A = \frac{8}{17}$ है, तो $\cot A + \sec A$ का मान क्या है?

[A] $4\frac{1}{120}$

[C] $5\frac{1}{120}$

[B] $2\frac{1}{120}$

[D] $3\frac{1}{120}$

$B=15$

$$\frac{15}{8} + \frac{17}{15} = \frac{361}{120}$$

14. If $\sin\theta = \sqrt{\frac{1}{6} \sqrt{\frac{1}{6} \sqrt{\frac{1}{6} \dots \infty}}}$ Then, $\tan\theta + \cot\theta = ?$

यदि $\sin\theta = \sqrt{\frac{1}{6} \sqrt{\frac{1}{6} \sqrt{\frac{1}{6} \dots \infty}}}$ तो, $\tan\theta + \cot\theta = ?$

[A] $\frac{36}{\sqrt{35}}$

[B] $\frac{36}{35}$

[C] $\frac{\sqrt{35}}{36}$

[D] $\sqrt{\frac{35}{36}}$

$\frac{1}{\sqrt{35}} + \sqrt{35}$

$\sin\theta = \frac{1}{6}$

$B = \sqrt{6^2 - 1^2} = \sqrt{35}$

$\sqrt{a \sqrt{a \sqrt{a \dots \infty}}} = a$

15. If $\cos A = \frac{63}{65}$, then find the value of $\tan A + \cot A$ (up to two places of decimal).

यदि $\cos A = \frac{63}{65}$, तो $\tan A + \cot A$ का मान ज्ञात कीजिए (दशमलव के दो स्थानों तक)।

SSC CHSL 2023 PRE

[A] 3.19

[C] 4.19

[B] 5.23

[D] 2.76

$P \rightarrow 16$

$$\frac{16}{63} + \frac{63}{16}$$

$$\approx 0.25 + 4$$

16. If $\operatorname{cosec} A = \frac{5}{4}$, then find the value of $4\cot A \sec A + 3$.

यदि $\operatorname{cosec} A = \frac{5}{4}$ है, तो $4\cot A \sec A + 3$ का मान ज्ञात कीजिए।

RRB NTPC GRADUATE LEVEL CBT-1 2025

~~✗~~ [A] 6
[C] 3

[B] ~~8~~
[D] 5

$\sin A \rightarrow S$

$\cos A \rightarrow C$

$\tan A \rightarrow T$

$$= 4 \frac{\cos A}{\sin A} \times \sec A + 3$$

$$= 4 \sec A + 3$$

$$= 4 \times 5 + 3$$

$$= 23$$

17. If $\sin A = \frac{\sqrt{3}}{7}$, and A is an acute angle, then find the value of $\sqrt{23} \sec A \csc A$.

यदि $\sin A = \frac{\sqrt{3}}{7}$ है, और A एक न्यून कोण है, तो $\sqrt{23} \sec A \csc A$ का मान ज्ञात कीजिए।

RRB NTPC GRADUATE LEVEL CBT-1 2025

[A] $\frac{14\sqrt{3}}{45}$

[B] $\frac{14\sqrt{46}}{3}$

[C] $\frac{7\sqrt{3}}{4}$

[D] $\frac{49\sqrt{6}}{6}$

$$B = \sqrt{7^2 - 3^2} = \sqrt{46}$$

$$= \sqrt{23} \times \frac{7}{\sqrt{46}} \times \frac{7}{\sqrt{3}}$$

$$= \frac{49 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}}$$

$$= \frac{49\sqrt{6}}{6}$$

18. If $5 \sin y + \cos y = \sqrt{13} \sin y$, find the value of $\tan y$.

यदि $5 \sin y + \cos y = \sqrt{13} \sin y$, तो $\tan y$ का मान ज्ञात कीजिए।

[RRB NTPC 12th Level CBT-2 (2026)], (RRB JE 2025)

[A] $\frac{-6-\sqrt{13}}{12}$

[B] $\frac{-5-\sqrt{13}}{22}$

[C] $\frac{-5-\sqrt{13}}{12}$

[D] $\frac{-5-\sqrt{13}}{17}$

(V.V.V.V.V. V.V.V.V.V.)

~~$5 \sin y - \sqrt{13} \sin y = -\cos y$~~

$(5 - \sqrt{13}) \sin y = -\cos y$

~~$\frac{\sin y}{\cos y} = \frac{-1}{5 - \sqrt{13}}$~~

$\tan y = \frac{-1}{5 - \sqrt{13}} \times \frac{5 + \sqrt{13}}{5 + \sqrt{13}}$
 $= \frac{-5 - \sqrt{13}}{12}$

$5^2 - \sqrt{13}^2$

19. If $10\sin A + \cos A = \sqrt{6}\sin A$, find the value of $\tan A$.

यदि $10\sin A + \cos A = \sqrt{6}\sin A$ है, तो $\tan A$ का मान ज्ञात कीजिए।

RRB NTPC GRADUATE LEVEL CBT-2 (2026)

[A] $\frac{-10 - \sqrt{6}}{96}$

[B] $\frac{-11 - \sqrt{6}}{96}$

[C] $\frac{-10 - \sqrt{6}}{94}$

[D] $\frac{-10 - \sqrt{6}}{99}$

20. If θ is an acute angle and $9\sin\theta = 5$, then find the value of $\frac{2}{3} \sqrt{5\cot^2\theta - 14\tan^2\theta}$
 यदि θ एक न्यून कोण है तथा $9\sin\theta = 5$ है, तो $\frac{2}{3} \sqrt{5\cot^2\theta - 14\tan^2\theta}$ का मान ज्ञात कीजिए।

RRB GROUP-D 2026

[A] $\frac{5}{\sqrt{11}}$
 [C] $\sqrt{\frac{11}{5}}$

[B] $\frac{11}{\sqrt{5}}$
 [D] $\sqrt{\frac{5}{11}}$

$$= \frac{2}{3} \times \sqrt{5 \times \frac{56}{25} - 14 \times \frac{25}{56}}$$

$$\sin\theta = \frac{5}{9} \rightarrow P$$

$$B = \sqrt{9^2 - 5^2}$$

$$= \sqrt{56}$$

$$= \frac{2}{3} \times \sqrt{\frac{99}{20}}$$

$$= \frac{2}{3} \times \frac{3\sqrt{11}}{2\sqrt{5}}$$

21. If $\cos\theta = \frac{5}{13}$, then find the value of $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$.

यदि $\cos\theta = \frac{5}{13}$ है, तो $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] $\frac{1}{3}$ $\sin\theta = \frac{12}{13}$

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

[B] $\frac{1}{25}$

[D] $\frac{1}{5}$

$$\sqrt{\frac{1-\frac{12}{13}}{1+\frac{12}{13}}} = \frac{1}{5}$$

22. Given that $\sin\theta = \frac{15}{17}$. Evaluate $\frac{15\cot\theta+17\sin\theta}{8\tan\theta+16\sec\theta}$, where $0^\circ < \theta < 90^\circ$?

यह दिया गया है कि $\sin\theta = \frac{15}{17}$ जहाँ $0^\circ < \theta < 90^\circ$, $\frac{15\cot\theta+17\sin\theta}{8\tan\theta+16\sec\theta}$ का मूल्यांकन करें?

SSC CHSL PRE 2024

[A] 23/49

[C] 49/26

[B] 49/23

[D] 26/23

$B=8$

~~$$\frac{15 \times \frac{8}{15} + 17 \times \frac{15}{17}}{8 \times \frac{15}{8} + 16 \times \frac{17}{8}}$$~~

$$\frac{23}{49}$$

23. If $\sin A = \frac{3}{5}$, then find the value of $\sqrt{\frac{11+3\operatorname{cosec} A}{4-5\sin A}}$.

यदि $\sin A = \frac{3}{5}$ है, तो $\sqrt{\frac{11+3\operatorname{cosec} A}{4-5\sin A}}$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

[A] 3

[C] $\sqrt{3}$

$$\sqrt{\frac{16}{1}}$$

~~[B] 4~~

[D] $\sqrt{2}$

24. If $\operatorname{cosec} \theta = 1.25$, then $\frac{4\tan\theta - 5\cos\theta + 1}{\sec\theta + 4\cot\theta - 1} = ?$

यदि $\operatorname{cosec} \theta = 1.25$ है, तो $\frac{4\tan\theta - 5\cos\theta + 1}{\sec\theta + 4\cot\theta - 1} = ?$

(RRB GROUP-D 2025)

[A] 2

[C] $\frac{9}{10}$

[B] $\frac{10}{11}$

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

$1 + .25$

$$\operatorname{cosec} \theta = \frac{5}{4} \rightarrow H$$

$$3 = P$$

$$\begin{aligned} & \frac{\frac{16}{3} - 3 + 1}{\frac{5}{3} + 3 - 1} \\ &= \frac{\frac{16 - 9 + 3}{3}}{\frac{5 + 9 - 3}{3}} \\ &= \frac{10}{12} \\ &= \frac{5}{6} \end{aligned}$$

25. If $\sin A = \frac{5}{7}$, find the value of $\frac{5\operatorname{cosec} A - 7\sin A}{2\sqrt{6}\sec A + 7\cos^2 A}$.

यदि $\sin A = \frac{5}{7}$ है, तो $\frac{5\operatorname{cosec} A - 7\sin A}{2\sqrt{6}\sec A + 7\cos^2 A}$ का मान ज्ञात कीजिए।

[RRB NTPC 12TH LEVEL CBT-1, 2026]

[A] $\frac{9}{23}$

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

[B] $\frac{14}{73}$

[D] $\frac{11}{46}$

$$\frac{7-5}{7 + 7 \times \frac{24}{49}} = \frac{2}{\frac{73}{7}}$$

$$B = \sqrt{7^2 - 5^2} = \sqrt{24} = 2\sqrt{6}$$

26. If $\operatorname{cosec} A = \sqrt{10}$, find the value of $\frac{3\sin^2 A + 4\cot^2 A}{6(\tan^2 A + \cos^2 A)}$.

यदि $\operatorname{cosec} A = \sqrt{10}$ है, तो $\frac{3\sin^2 A + 4\cot^2 A}{6(\tan^2 A + \cos^2 A)}$ का मान ज्ञात कीजिए।

[RRB NTPC 12TH LEVEL CBT-1, 2026]

[A] $\frac{726}{91}$
[C] $\frac{545}{19}$

[B] $\frac{1017}{182}$
[D] $\frac{1089}{182}$

$$\frac{\frac{3}{10} + 36}{6\left(\frac{1}{9} + \frac{9}{10}\right)}$$

$$\frac{363}{10}$$

$$\frac{363}{10} \times \frac{15}{91}$$

$$\operatorname{cosec} A = \frac{\sqrt{10}}{1} \rightarrow H$$

$$1 \rightarrow P$$

$$B = \sqrt{10 - 1} = 3$$

27. If $\cos A = \frac{4}{5}$, find the value of $\frac{\sin^2 A - 5\cos^2 A + \sec^2 A}{\tan^2 A}$.

यदि $\cos A = \frac{4}{5}$ है, तो $\frac{\sin^2 A - 5\cos^2 A + \sec^2 A}{\tan^2 A}$ का मान ज्ञात कीजिए।

[RRB NTPC 12TH LEVEL CBT-1, 2026]

[A] $-\frac{451}{225}$

[B] $\frac{23}{225}$

[C] $\frac{109}{225}$

[D] $-\frac{511}{225}$

H.W

28. If $\sin A = \frac{5}{13}$. Then find the value of $\frac{\cos A - 2 \tan A}{\sin A + 3 \tan A}$.

यदि $\sin A = \frac{5}{13}$ है, तो $\frac{\cos A - 2 \tan A}{\sin A + 3 \tan A}$ का मान ज्ञात कीजिए।

(SSC CGL MAINS 2024), (RRB GROUP-D, 2025)

[A] $\frac{11}{255}$
[C] $\frac{14}{255}$

12 = B

[B] $\frac{12}{255}$
[D] $\frac{13}{255}$

$$\frac{7}{13} \times \frac{5}{13} = \frac{35}{169}$$

$$\frac{\frac{12}{13} - 2 \times \frac{5}{13}}{\frac{5}{13} + 3 \times \frac{5}{13}} = \frac{\frac{12 - 10}{13}}{\frac{5 + 15}{13}} = \frac{2}{20} = \frac{1}{10}$$

If $\cos A = \frac{9}{41}$, A is an acute angle, then find the value of $\operatorname{cosec} A \cos A + \sec A \sin A$.

यदि $\cos A = \frac{9}{41}$ है और A एक न्यून कोण है, तो $\operatorname{cosec} A \cos A + \sec A \sin A$ का मान ज्ञात कीजिए।

RRB NTPC GRADUATE LEVEL CBT-1 2025

[A] $4 \frac{241}{360}$
[C] $5 \frac{317}{360}$

$\rho = 40$

[B] $3 \frac{119}{180}$
[D] $2 \frac{131}{180}$

$$= \cot A + \tan A$$

$$= \frac{9}{40} + \frac{40}{9}$$

$$= \frac{1681}{360}$$

If $\frac{(\sin\theta + \cos\theta)}{(\sin\theta - 4\cos\theta)} = 11$, then the value of $\frac{(13\sin^2\theta - 3)}{\cos^2\theta}$ is:

यदि $\frac{(\sin\theta + \cos\theta)}{(\sin\theta - 4\cos\theta)} = 11$ है, तो $\frac{(13\sin^2\theta - 3)}{\cos^2\theta}$ का मान ज्ञात कीजिए।

RRB NTPC GRADUATE LEVEL CBT-1 2025

[A] $\frac{471}{2}$

[A] $\frac{405}{2}$

[B] $\frac{399}{2}$

[B] 15

$$\frac{13 \times \frac{81}{85} - 3}{\frac{4}{85}} = \frac{798}{4}$$

$$S + C = 11S - 44C$$

$$45C = 10S$$

$$\frac{C}{S} = \frac{10}{45} \Rightarrow \frac{C}{S} = \frac{2}{9}$$

$$H = \sqrt{85}$$

$$\frac{1053}{251}$$



#



29. If $\cos t = x$ and t is an acute angle, find the value of $\sin t$.
यदि $\cos t = x$ तथा t एक न्यून कोण है, तो $\sin t$ का मान ज्ञात कीजिए।
(RRB GROUP-D 2025)

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

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

☒ [C] $\sqrt{1-x^2}$

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

$$\sin t = \sqrt{1 - \cos^2 t}$$

If $\frac{x}{y} = \cot \theta$, where θ is an acute angle, then $\operatorname{cosec} \theta =$ _____.

यदि $\frac{x}{y} = \cot \theta$ है, जहाँ θ एक न्यून कोण है, तो $\operatorname{cosec} \theta$ का मान ज्ञात कीजिए।

RRB NTPC GRADUATE LEVEL CBT-1 2025

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

[B] $\frac{\sqrt{y^2-x^2}}{y}$

[C] $\frac{y}{x}$

[D] $\frac{\sqrt{x^2+y^2}}{y}$

$\frac{H}{P} = \frac{\sqrt{x^2+y^2}}{y}$



If $\sin\theta = x$, then $\frac{\sqrt{1+x(\tan\theta)}}{x} = \underline{\hspace{2cm}}$.

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

~~[A]~~ $\frac{1}{\sqrt{1-x}}$

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

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

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

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

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

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

30. If $\sin\theta = \frac{a}{\sqrt{a^2+b^2}}$, $0^\circ < \theta < 90^\circ$, then the value of $\sec\theta + \tan\theta$ is:

यदि $\sin\theta = \frac{a}{\sqrt{a^2+b^2}}$, $0^\circ < \theta < 90^\circ$, तो $\sec\theta + \tan\theta$ का मान है-

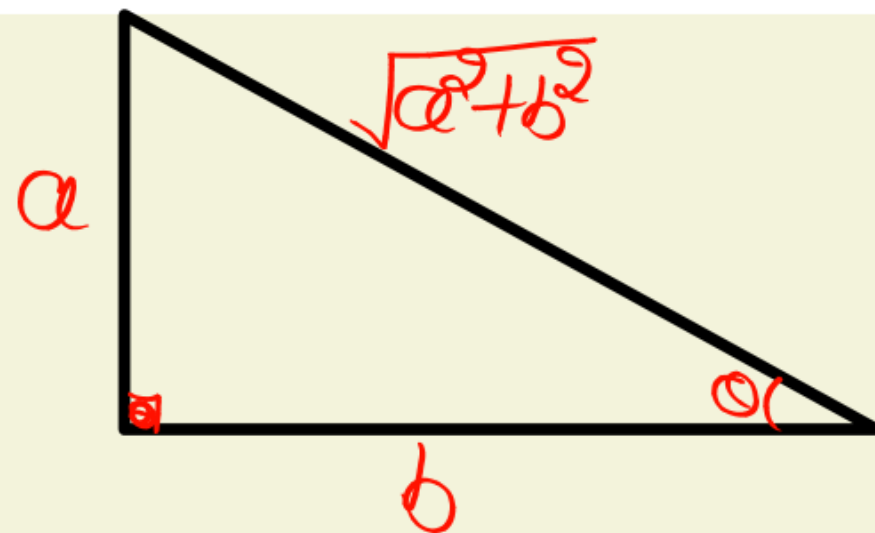
~~[A]~~ $\frac{\sqrt{a^2+b^2}+a}{b}$

[B] $\frac{\sqrt{a^2+b^2}+b}{2a}$

$\frac{\sqrt{a^2+b^2}}{b} + \frac{a}{b}$

[C] $\frac{\sqrt{a^2+b^2}+a}{2b}$

[D] $\frac{\sqrt{a^2+b^2}+b}{a}$



31. If $\sin\theta = \frac{2xy}{x^2+y^2}$, then find $\tan\theta$?

यदि $\sin\theta = \frac{2xy}{x^2+y^2}$ तो $\tan\theta$ ज्ञात कीजिए?

(SSC CHSL PRE 2024)

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

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

[B]

$\frac{2xy}{x^2-y^2}$

[D]

$\frac{x^2-y^2}{x^2+y^2}$

a^2-b^2 , $2ab$, a^2+b^2
B P H

32. If $\tan \theta = \frac{1-p^2}{2p}$ and θ is an acute angle, find the value of $\sin \theta$.

यदि $\tan \theta = \frac{1-p^2}{2p}$ है तथा θ एक न्यून कोण है, तो $\sin \theta$ का मान ज्ञात कीजिए।

(RRB GROUP-D 2025)

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

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

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

[D] $\frac{1+p^2}{1-p^2}$

$1-p^2, 2p, 1+p^2$

33. If $\cos \theta = \frac{4x}{1+4x^2}$ then what is the value of $\sin \theta$?

यदि $\cos \theta = \frac{4x}{1+4x^2}$ तो $\sin \theta$ का मान क्या होगा?

(RRB GROUP-D 2025)

[A] $\frac{1+4x^2}{1-4x^2}$

[B] $\frac{1+4x^2}{4x^2}$

[C] $\frac{1-4x^2}{1+4x^2}$

[D] $\frac{1-4x^2}{4x}$

$a=1$
 $b=2x$

$a^2 - b^2, ab, a^2 + b^2$
 $1 - 4x^2, 4x, 1 + 4x^2$
H

34. If $\operatorname{cosec}\theta = b/a$, then $\frac{\sqrt{3}\cot\theta+1}{\tan\theta+\sqrt{3}}$ is equal to:

यदि $\operatorname{cosec}\theta = b/a$ है, तो $\frac{\sqrt{3}\cot\theta+1}{\tan\theta+\sqrt{3}}$ _____ के बराबर है।

[A] $\frac{\sqrt{b^2-a^2}}{a}$

[C] $\frac{\sqrt{a^2+b^2}}{b}$

[B] $\frac{\sqrt{b^2+a^2}}{a}$

[D] $\frac{\sqrt{b^2-a^2}}{b}$

$\operatorname{cosec}\theta = \frac{b}{a} \rightarrow H$
 $a \rightarrow p$

$\frac{\sqrt{3}\cot\theta+1}{1+\sqrt{3}\cot\theta}$

$= \cot\theta = \frac{\sqrt{b^2-a^2}}{a}$

35. If $\frac{\sin\theta}{x} = \frac{\cos\theta}{y}$, then $\sin\theta - \cos\theta$ is:

यदि $\frac{\sin\theta}{x} = \frac{\cos\theta}{y}$, है, तो $\sin\theta - \cos\theta$ क्या होगा?

(SSC CGL MAINS 2025)

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

[B] $\frac{x-y}{\sqrt{3x^2+5y^2}}$

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

[D] $\frac{5x-y}{3\sqrt{x^2+y^2}}$

$\tan\theta = \frac{P}{B}$

$\sqrt{x^2+y^2} = H$