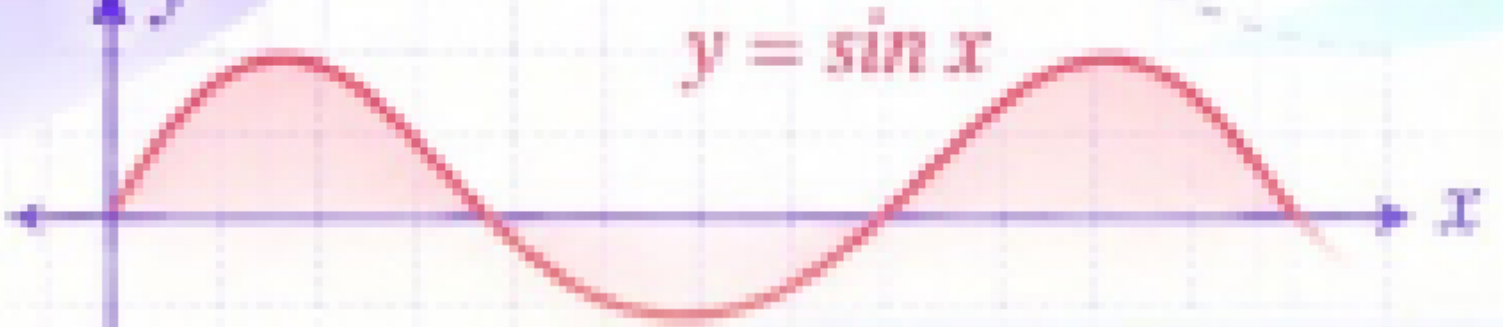




$y = \sin x$

A graph of the sine function $y = \sin x$ on a coordinate plane. The x-axis is labeled x and the y-axis is labeled y . The curve starts at the origin (0,0), reaches a peak at $y=1$, crosses the x-axis at $x=\pi$, reaches a trough at $y=-1$, and crosses the x-axis again at $x=2\pi$. The area under the curve is shaded in light red.

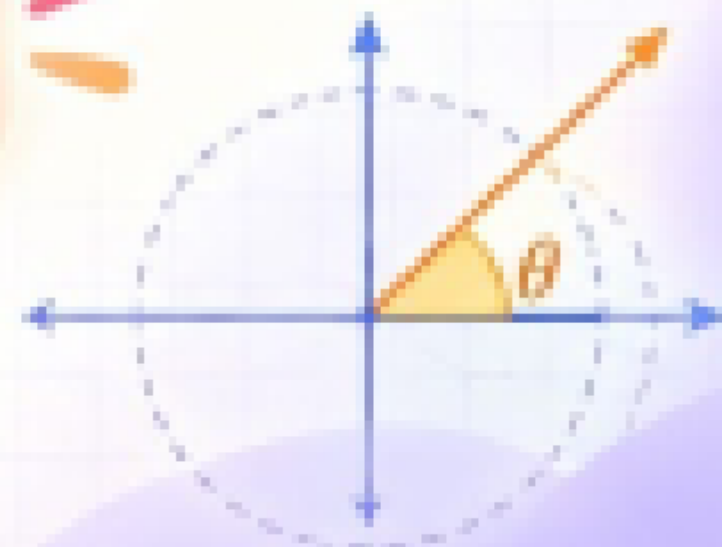
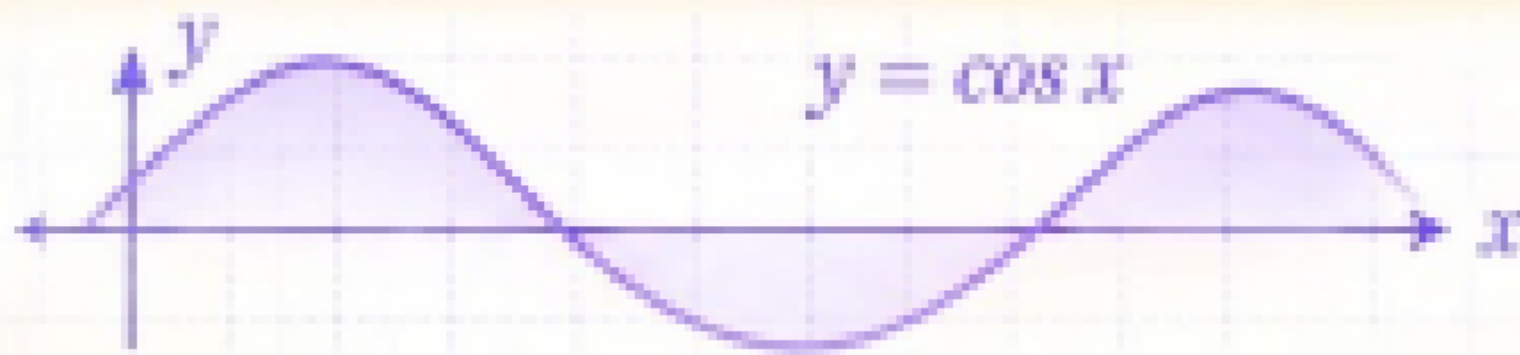
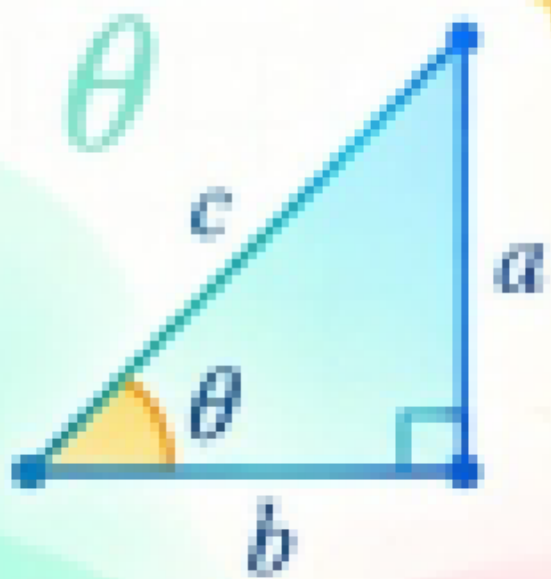
$\sin^2 \theta + \cos^2 \theta = 1$

Railway Foundation Batch

Trigonometry

त्रिकोणमिति

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





Railway

FOUNDATION

ADMISSION **OPEN NOW**



MATHS
GAGAN SIR



REASONING
DEEPAK SIR



REASONING
VIKRAMJEET SIR

INCLUDES

- ✓ Basic to Advanced
- ✓ Conceptual Clarity
- ✓ PDFS & Notes



SCIENCE
HARISH SIR



SCIENCE
RADHIKA MA'AM



G.S
JEET SIR

INCLUDES

- ✓ TEST
- ✓ BILINGUAL
- ✓ LIVE CLASSES

LIVE CLASSES

COURSE VALIDITY
2 YEARS

COURSE FEE ₹ 999/-

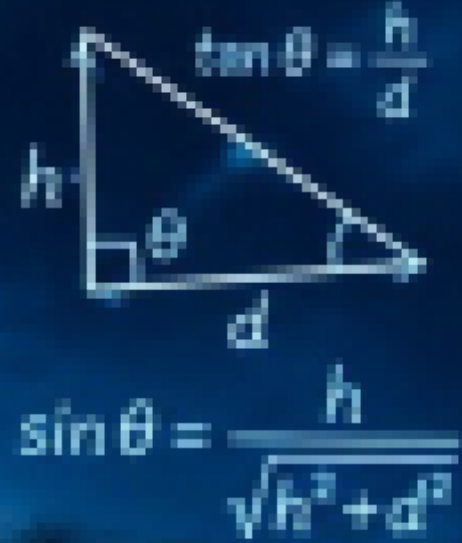
Download **Selectionway** App



Railway के सभी Exams

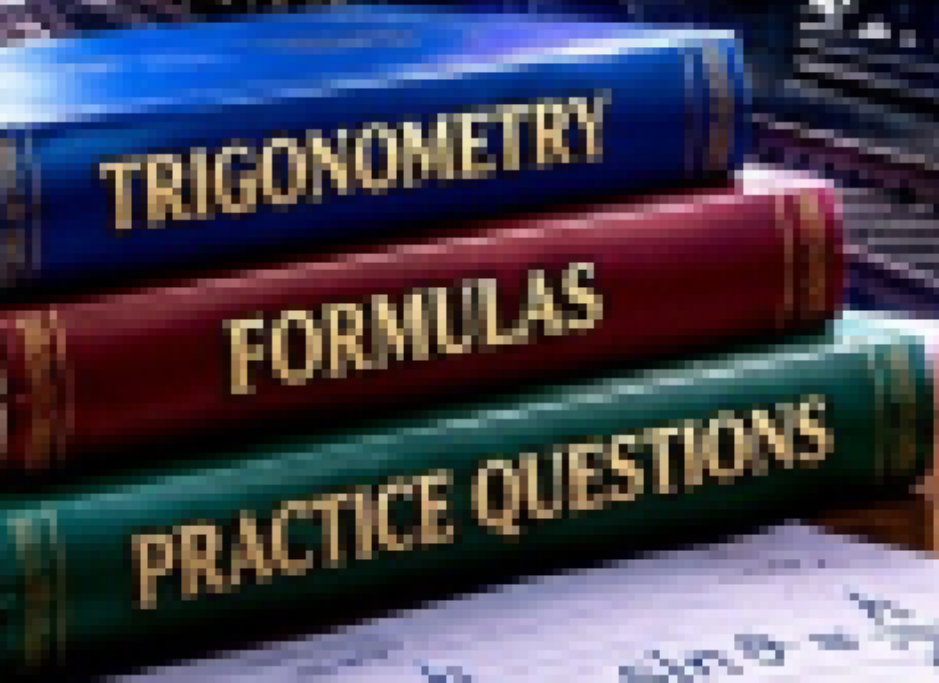
के syllabus में

Trigonometry है!



RAILWAY EXAMS

- | | |
|--|---|
| ☒ RRB NTPC ✓ | ☒ RRB JE ✓ |
| ☒ RRB Group-D ✓ | ☒ RRB RPF (SI) ✓ |
| ☒ RRB ALP ✓ | ☒ RRB RPF (Constable) ✓ |
| ☒ RRB Technician ✓ | ☒ RRB Paramedical ✓ |

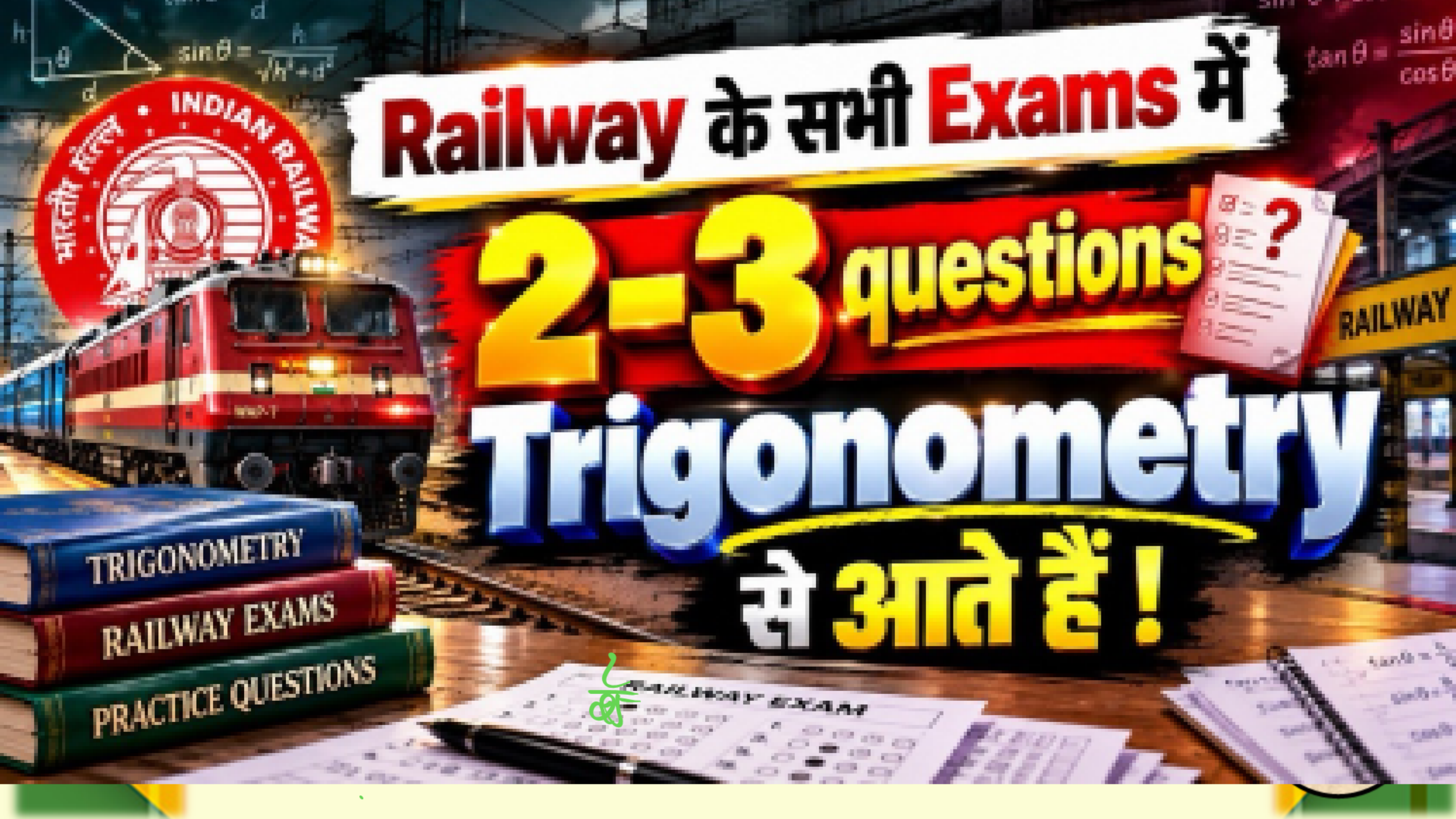


Railway के सभी Exams में

2-3 questions

Trigonometry

से आते हैं !



Total Sheets = 5

Sheet 1

Basics Sheet

[सबसे ज्यादा सवाल यहीं से आते हैं]



Sheet 2

$\sin^2 \theta + \cos^2 \theta = 1$ पर आधारित ✓

$$\sin^2 \theta + \cos^2 \theta = 1$$

Sheet 3

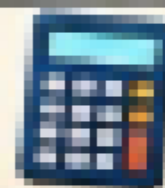
इन दोनों Identities पर आधारित:

$$\sec^2 \theta = 1 + \tan^2 \theta \quad \checkmark$$

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

Sheet 4

Value Putting Based ✓



Sheet 5

Trigonometry High Level Identities, Formula



Trigonometry की 5 Sheets में लगभग

300⁺

Questions ✓

और जितना Class में पढ़ाएंगे, केवल उतना ही पढ़ लीजिए।

Trigonometry

proper **Formula based** topic हैं

जिसमें आपको बहुत सारे

Formulas याद करने होते हैं

और **Formula** याद करने का **एक ही तरीका**

हर Formula पर बहुत सारे
Questions practice करना पड़ेगा

जो आपको **batch** में कराया जाएगा।

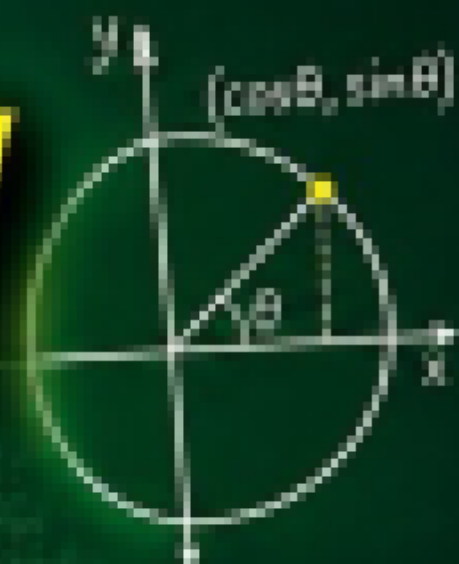
$$\sin^2 \theta + \cos^2 \theta = 1$$

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

$$\sec^2 \theta = 1 + \tan^2 \theta$$



$$\sin \theta = \frac{\text{Perpendicular}}{\text{Hypotenuse}}$$



$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$
$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

TRIGONOMETRY

FORMULAS

PRACTICE QUESTIONS

CONCEPTS

Trigonometry End होने के बाद हम पढ़ेंगे -

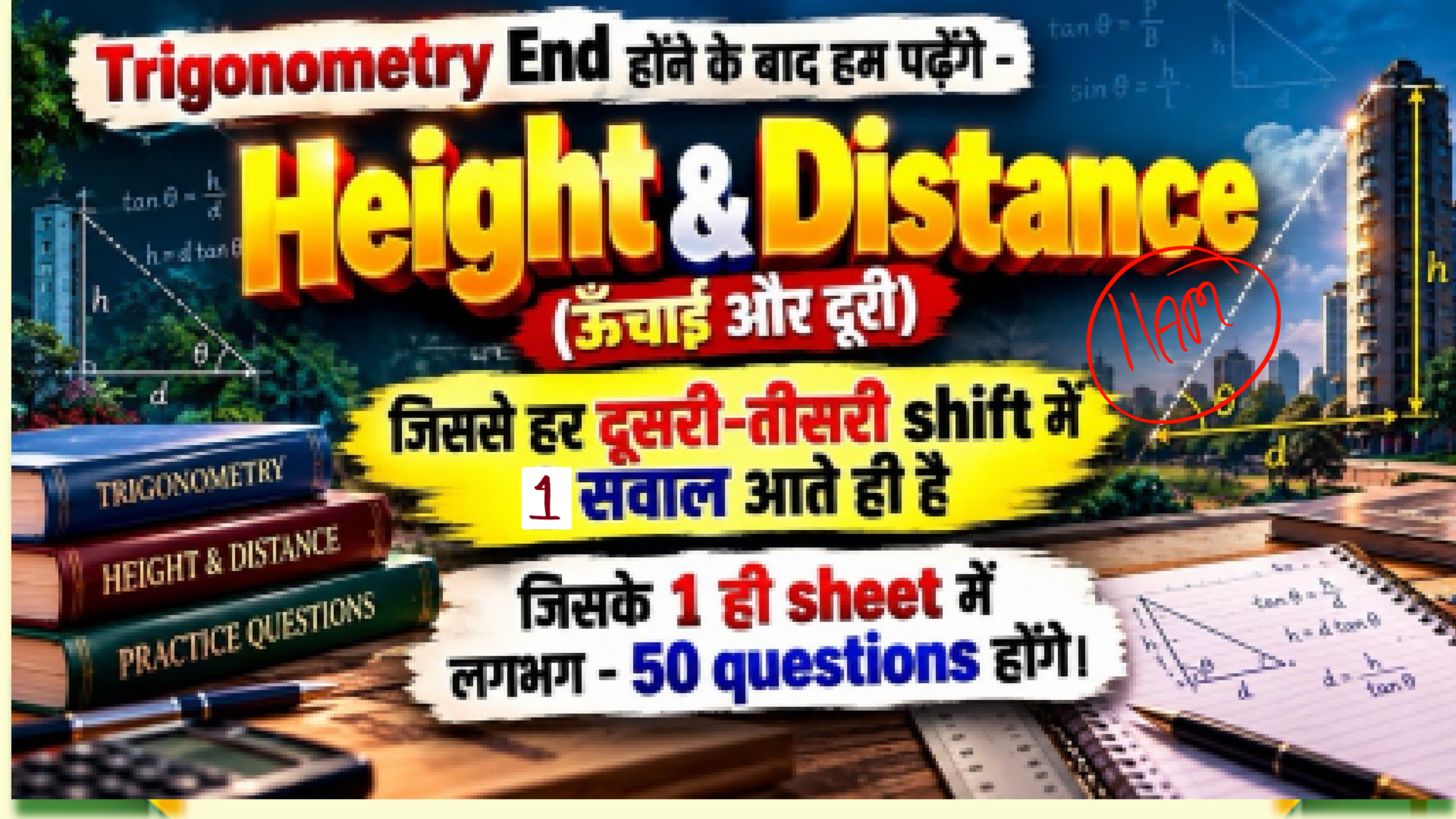
Height & Distance

(ऊँचाई और दूरी)

जिससे हर दूसरी-तीसरी shift में

1 सवाल आते ही हैं

जिसके **1** ही sheet में
लगभग - **50 questions** होंगे!



ENGLISH MEDIUM

SelectionWay
SELECTION MATHS



RAILWAY MATHS SAMPOORN MANTHAN

3600+ Questions Chapter-wise

All questions asked by RRB from 2018 till now

Useful for

RRB NTPC (CBT-1 & CBT-2), ALP, Technician,
Group-D, RPF SI & Constable, JE and all other
Railway examinations.

India's First Video
Solution Book

Concept &
Type-wise + Level-wise

Smart Approach
and Short Tricks



Gagan Pratap Sir

RAILWAY MATHS SAMPOORN MANTHAN



3600+
Questions



Chapter-wise
Coverage



Concept +
Short Tricks

Useful For

RRB NTPC (Graduate + U.G Level), ALP, Technician,
JE, Group-D और सभी Railway Exams के लिए



Book Available on **Flipkart**





TRIGONOMETRY

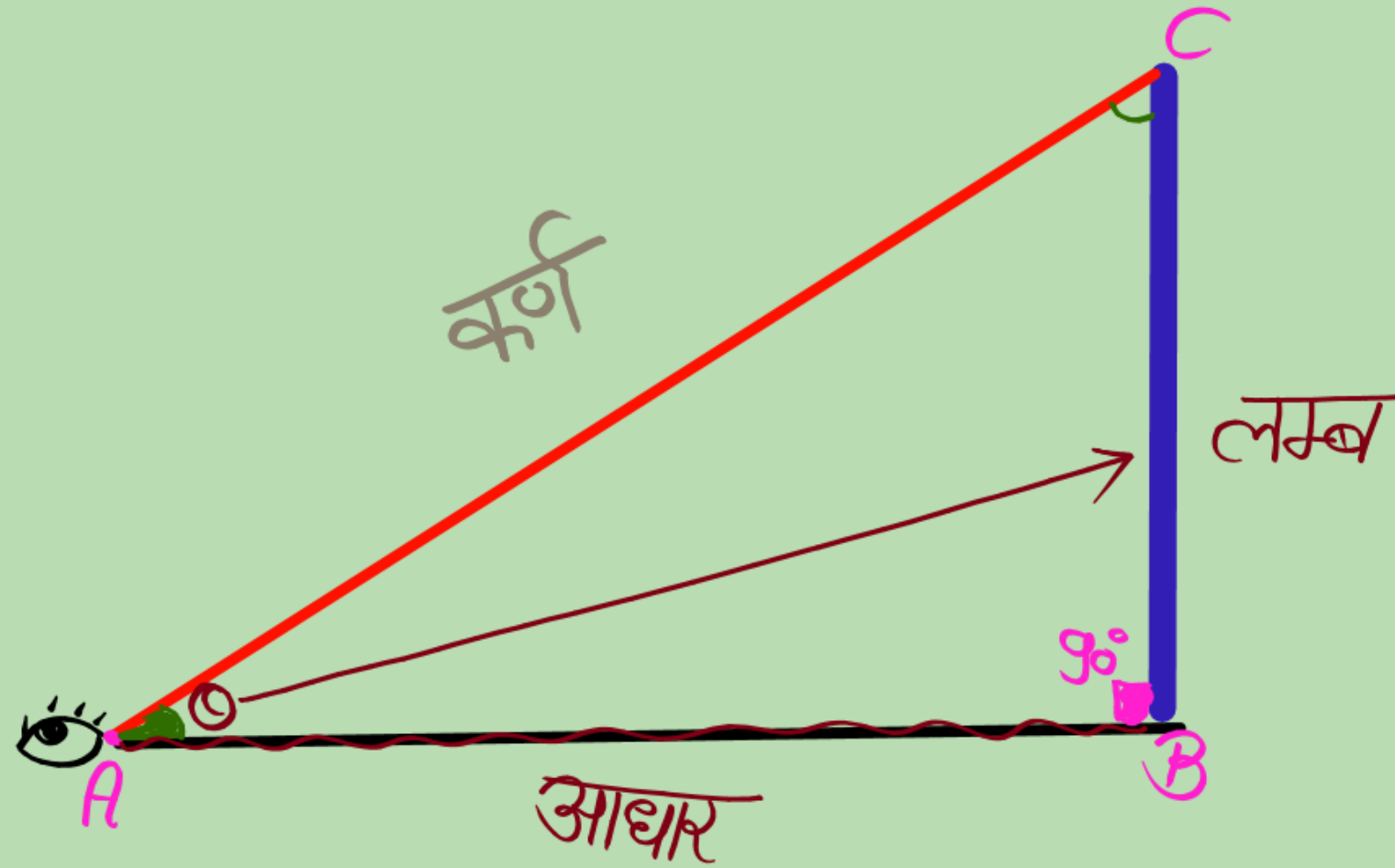
(त्रिकोणमिति)



$$\angle B = 90^\circ$$

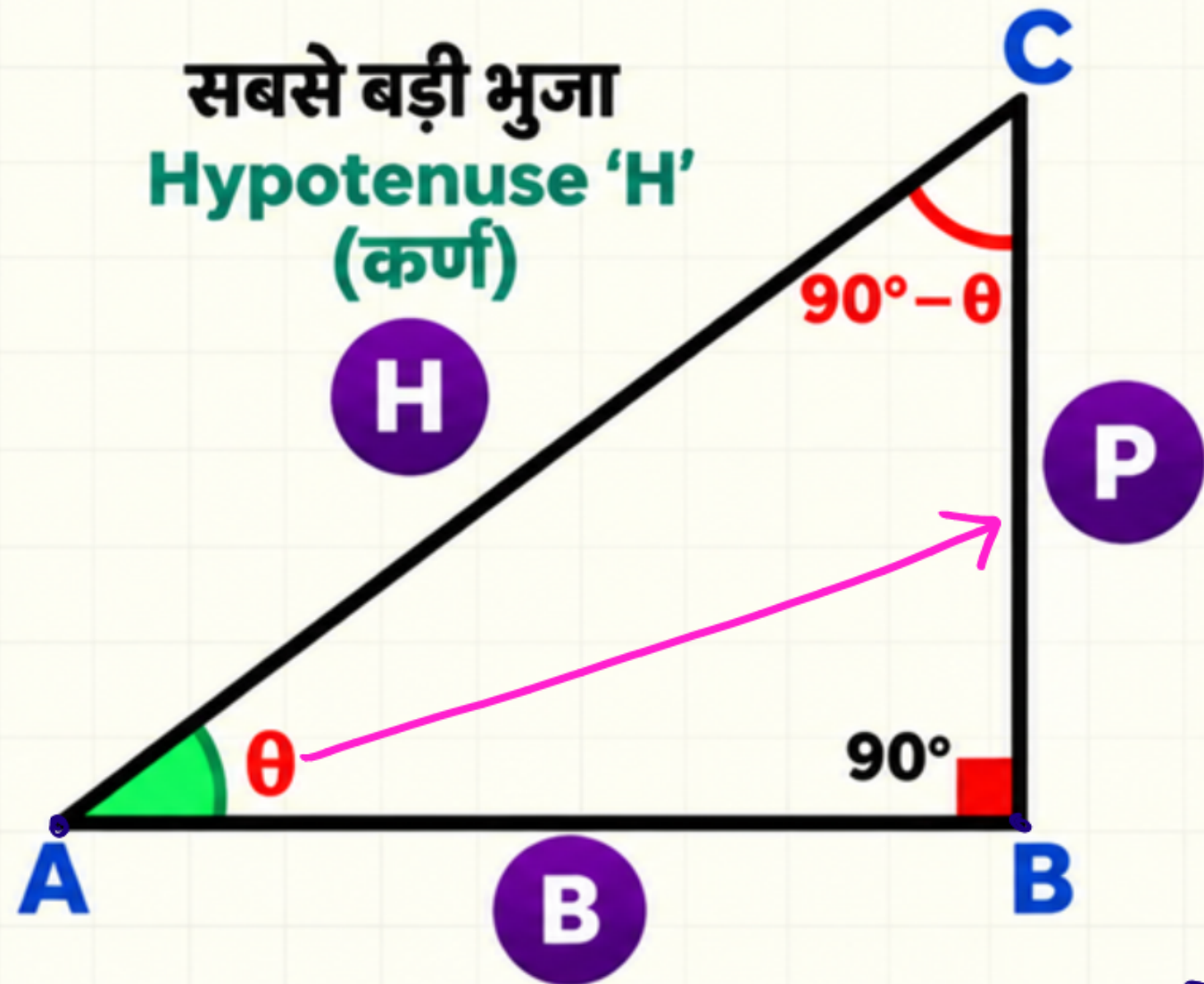
$$\angle A + \angle C = 90^\circ$$

✓
न्यूनकोण



AB & BC $\rightarrow$ Perpendicular sides

Trigonometry (त्रिकोणमिति)



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

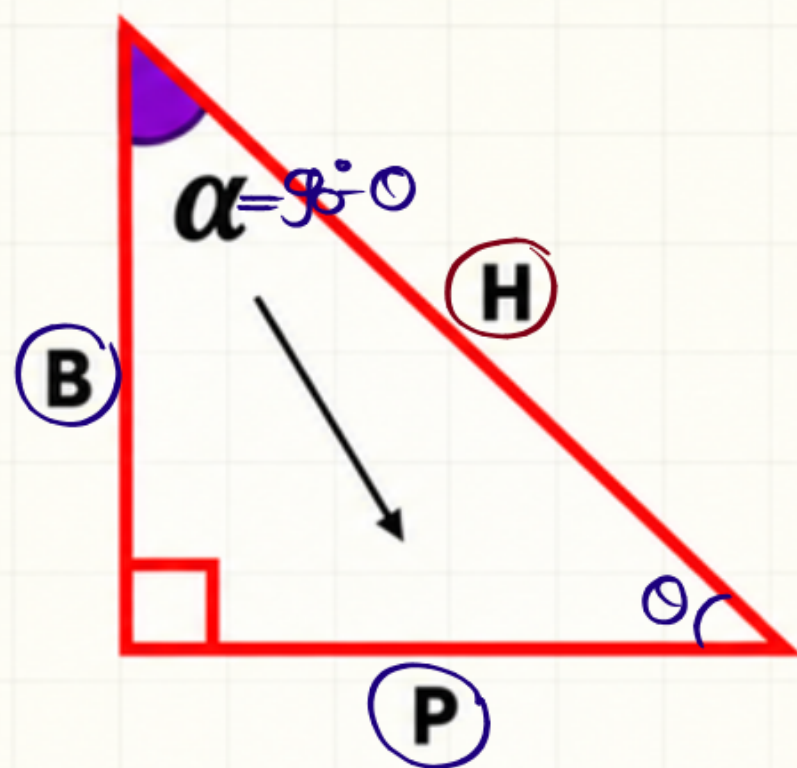
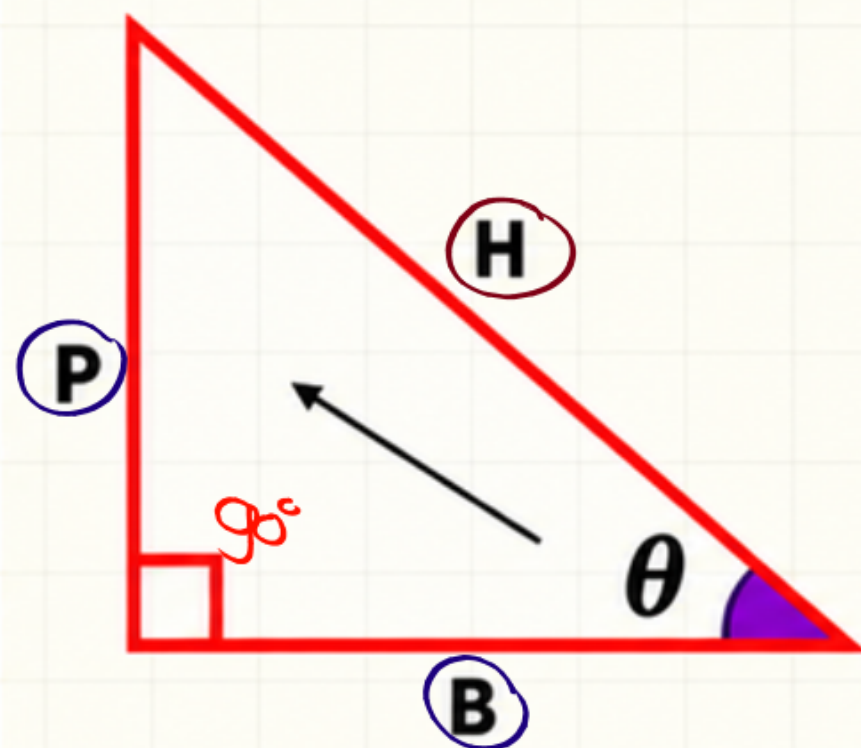
समकोण
 $\triangle ABC$

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

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

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

Trigonometry (त्रिकोणमिति)



H → Hypotenuse (कर्ण)
P → Perpendicular (लम्ब)
B → Base (आधार)

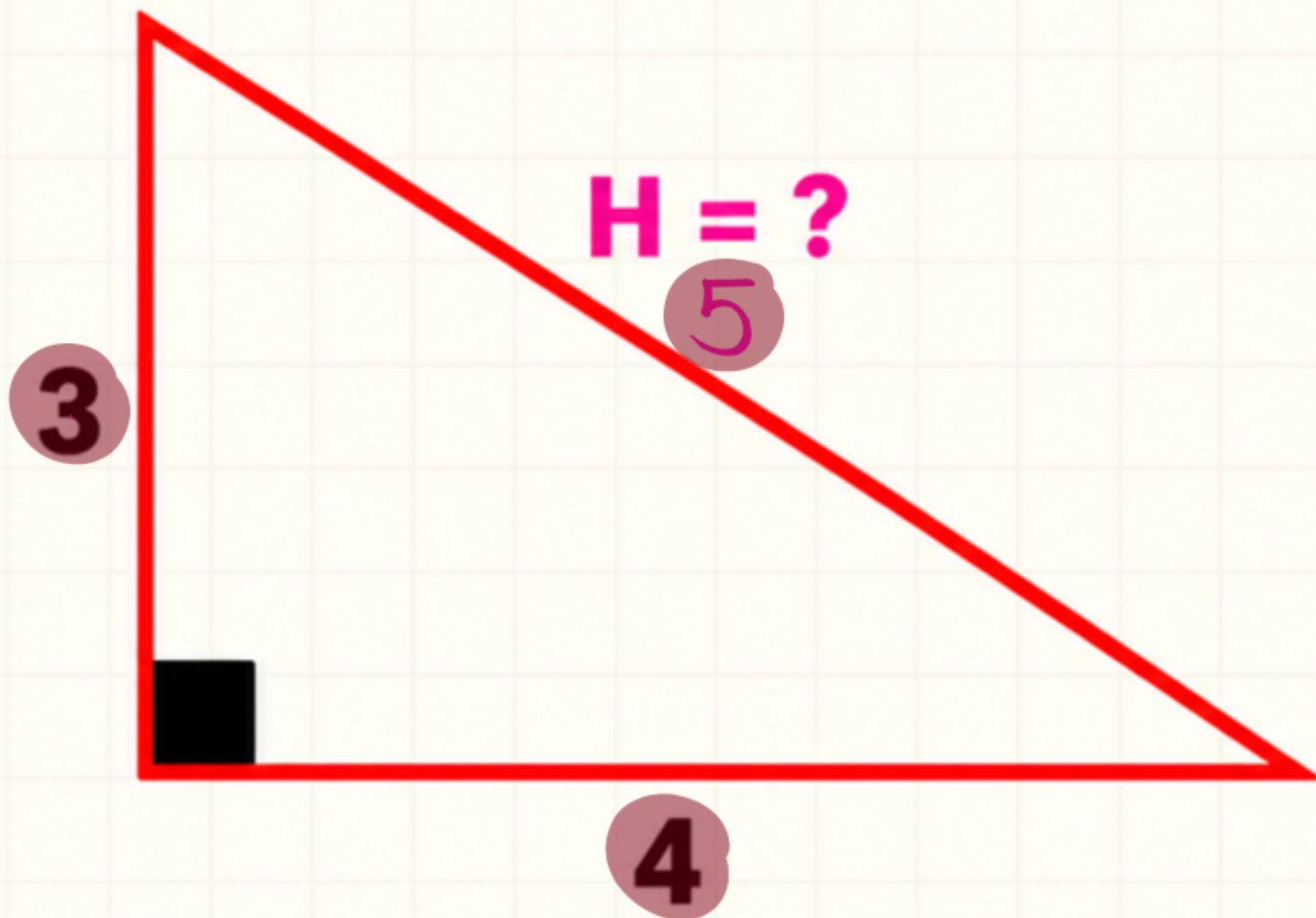
$$H^2 = P^2 + B^2$$

Pythagoras Theorem

A Pythagoras triplet is a set of +ve integers a , b and c that fits the rule (एक पाइथागोरस त्रिक धनात्मक संख्याएँ a , b , c का एक ऐसा समूह है, जो इस नियम को संतुष्ट करता है)

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

$$3^2 + 4^2 = 5^2 \quad \therefore 3, 4, 5 \text{ are Triplets}$$



Triplets $\rightarrow$ $(3, 4, 5)$
integer

$$H^2 = 3^2 + 4^2$$

$$H^2 = 9 + 16$$

$$H^2 = 25$$

$$H = 5 \checkmark$$

$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$



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

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) ✓

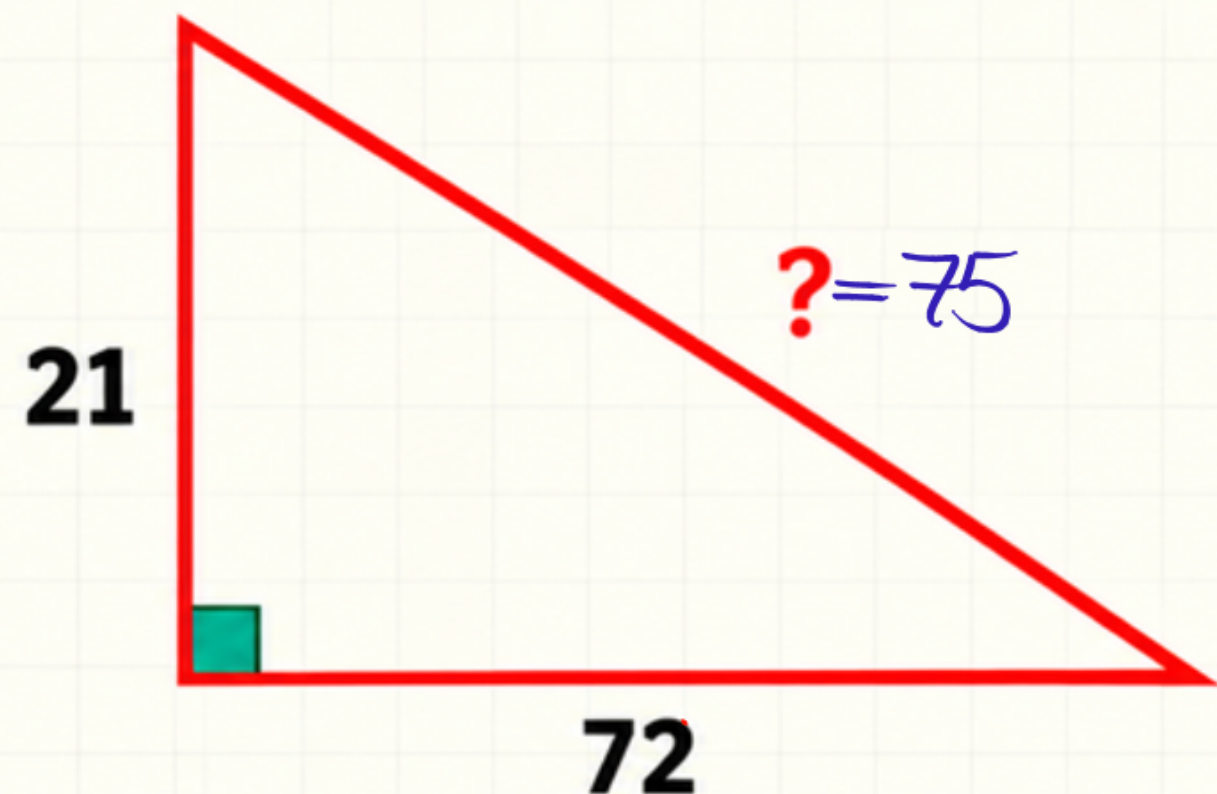
(36, 77, 85) ✓

(39, 80, 89) ✓

(48, 55, 73) ✓

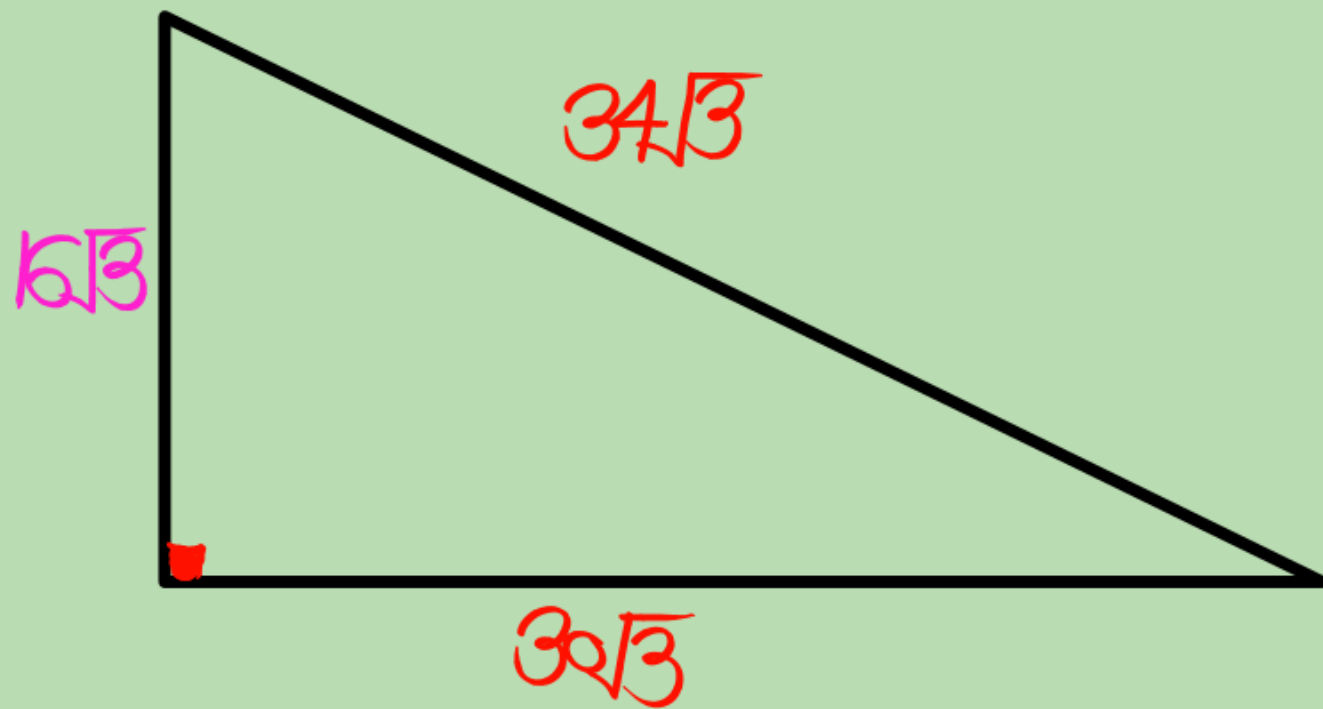
(65, 72, 97) ✓

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



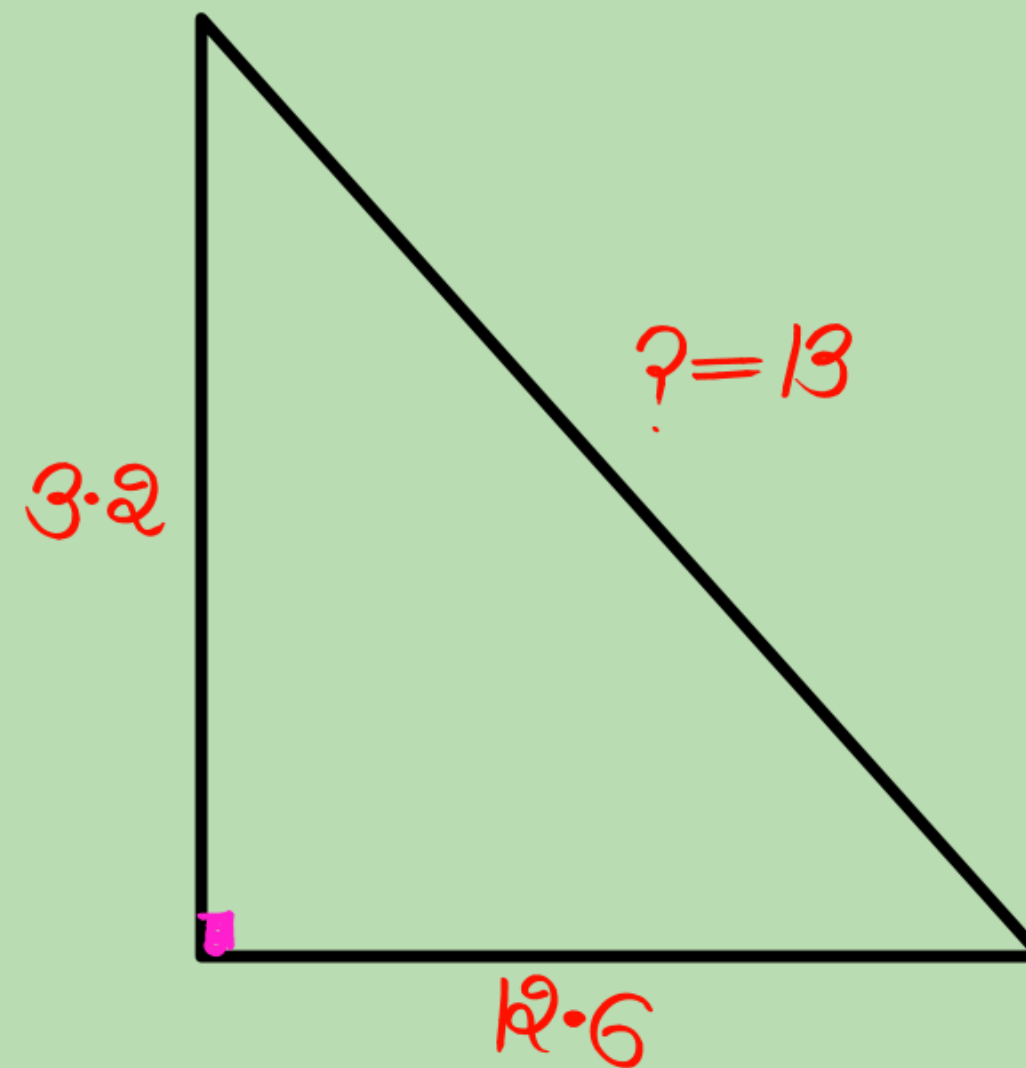
÷3

(7, 24, 25) × 3



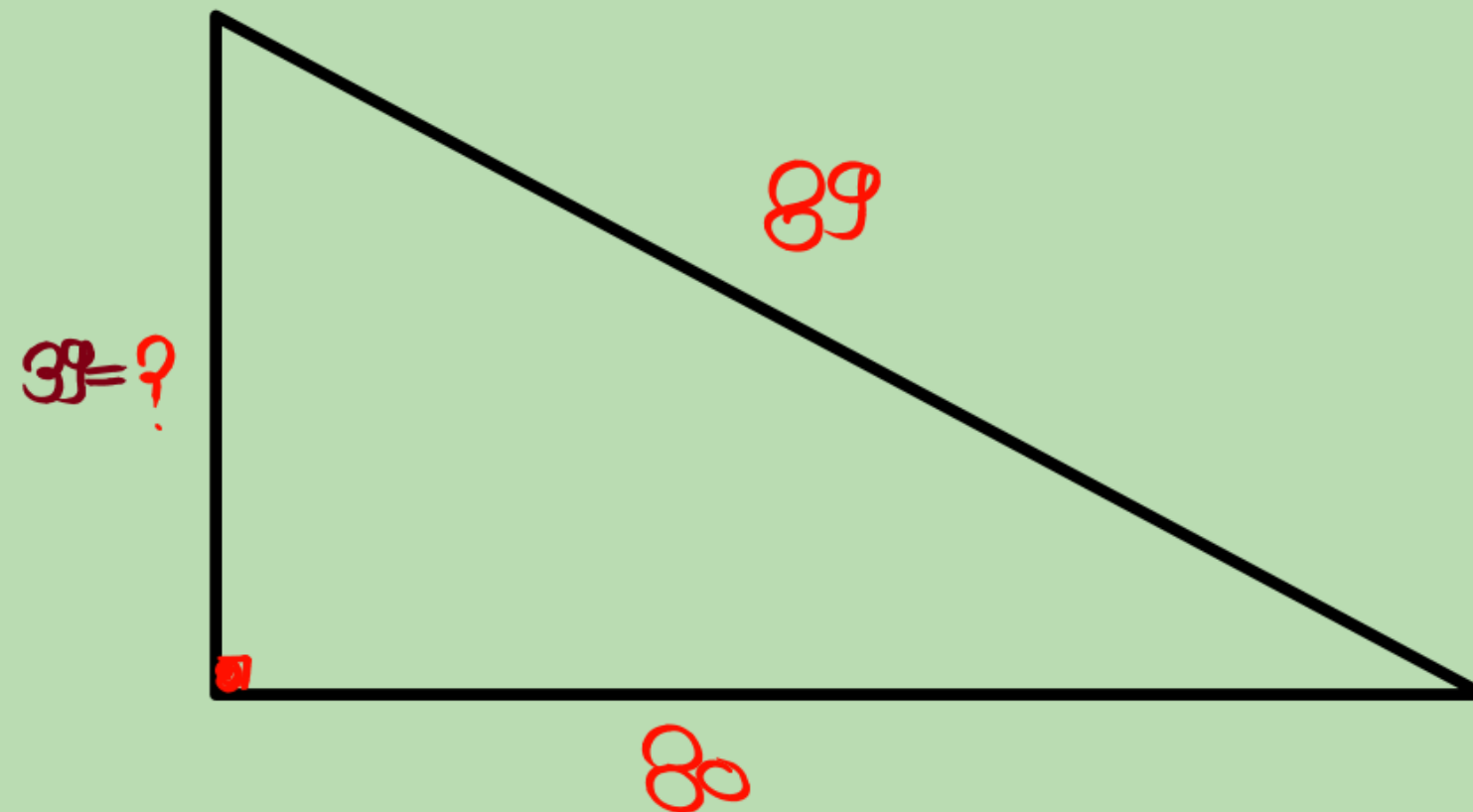
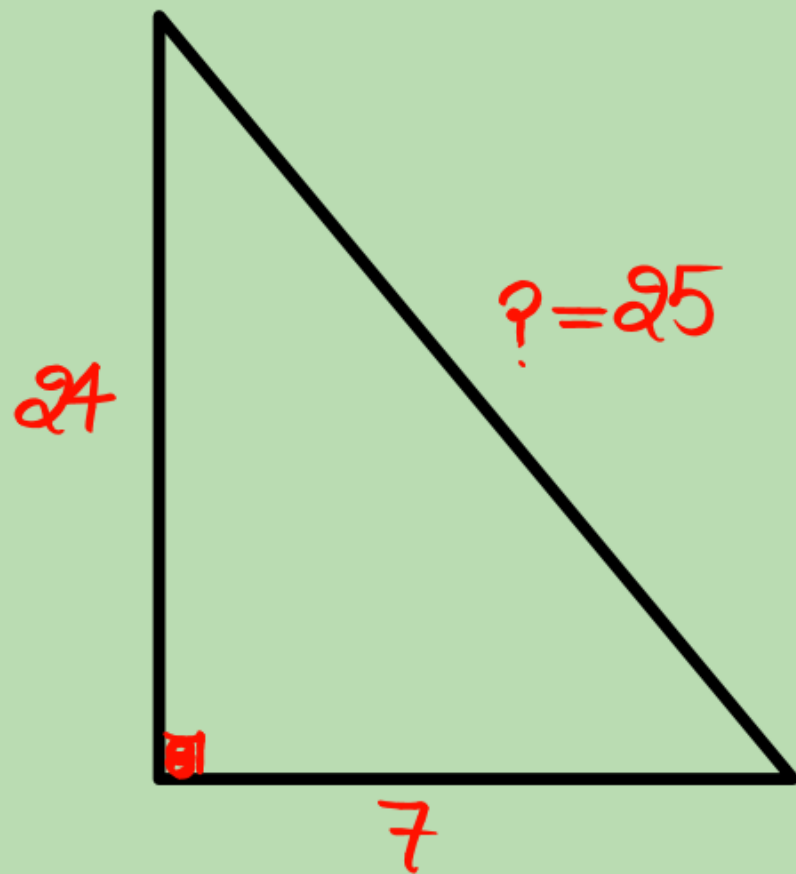
$\div 2\sqrt{3}$

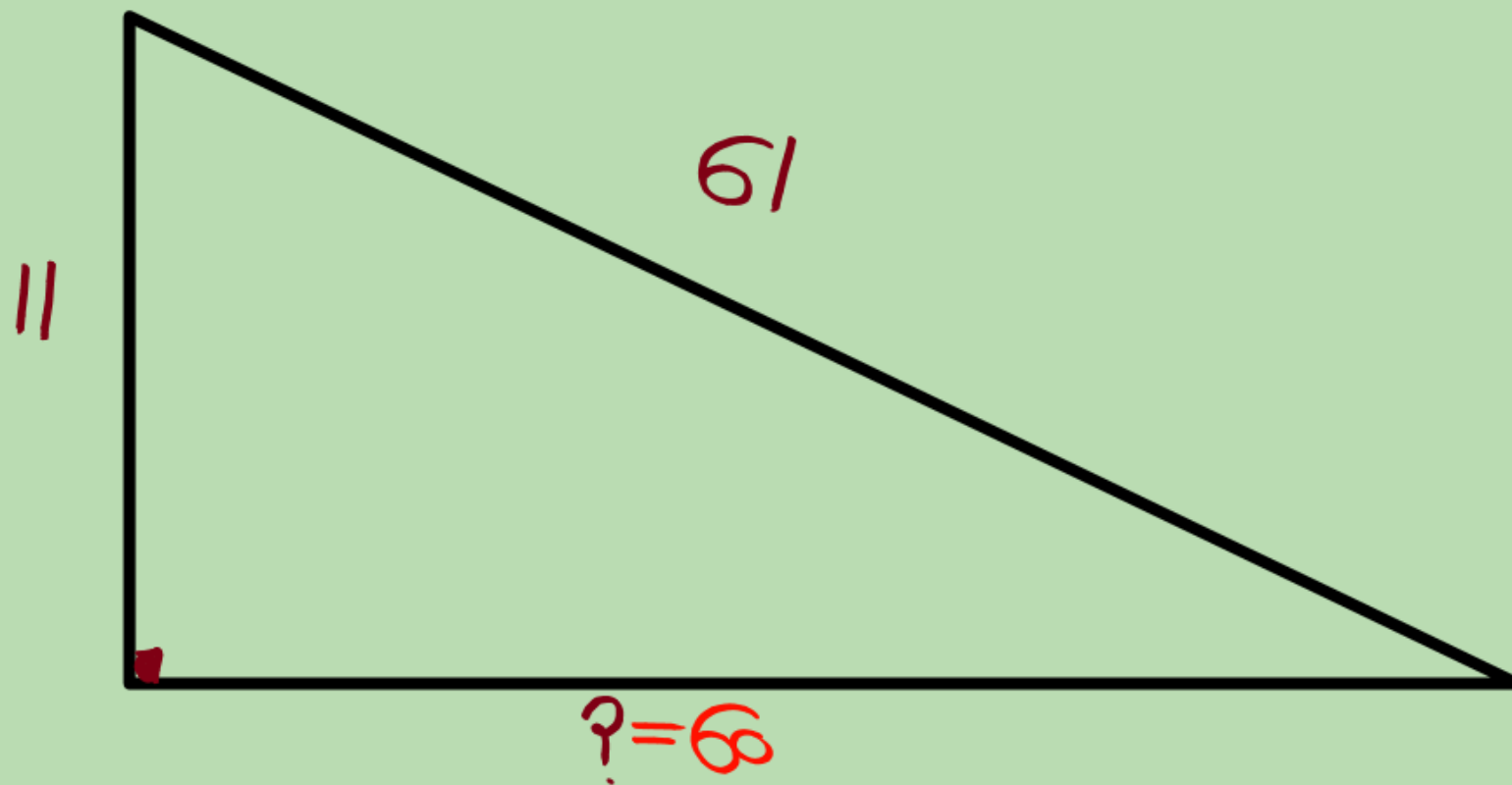
$(8, 15, 17)^H$



$\div .2$

~~$3.2, 12.6$~~
 $(16, 30, 34) \times .2$ ✓





$(11, 60, 61)$

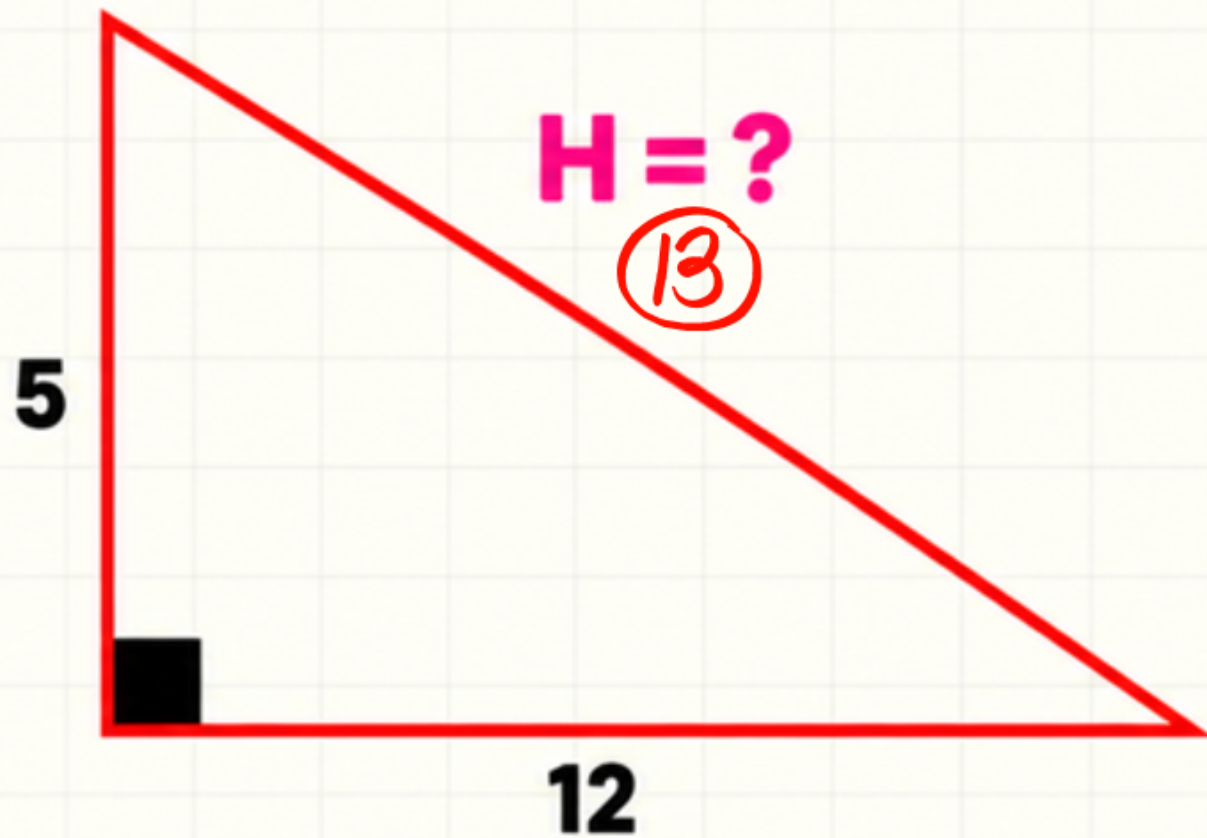
$$a^2 - b^2 = (a - b) \times (a + b)$$



$$= \sqrt{2 \times 200}$$

$$= 20$$





$(5, 12, 13) \rightarrow$ triple

~~$$H^2 = 5^2 + 12^2$$~~

~~$$H^2 = 25 + 144$$~~

~~$$H^2 = 169$$~~

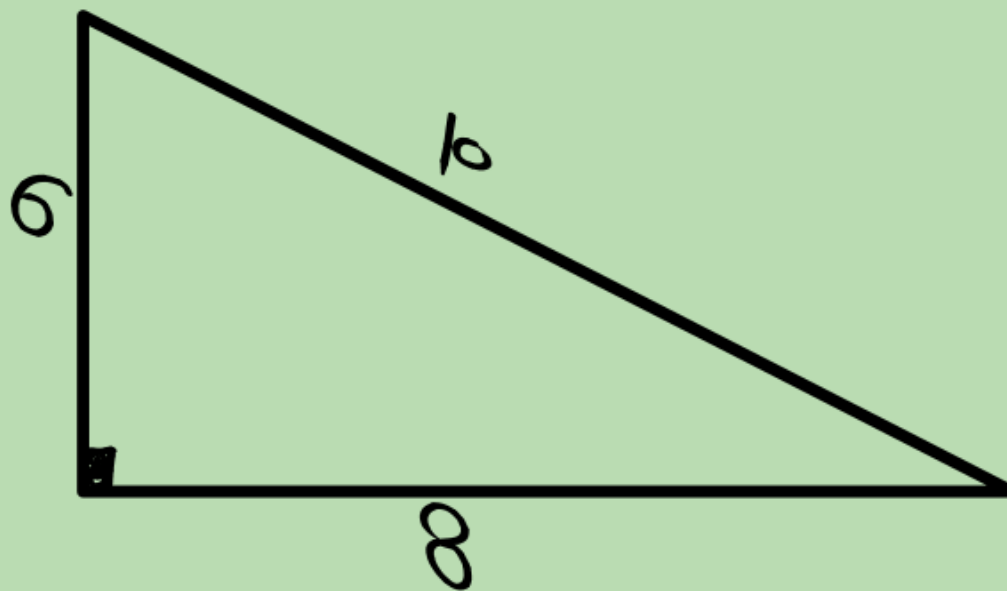
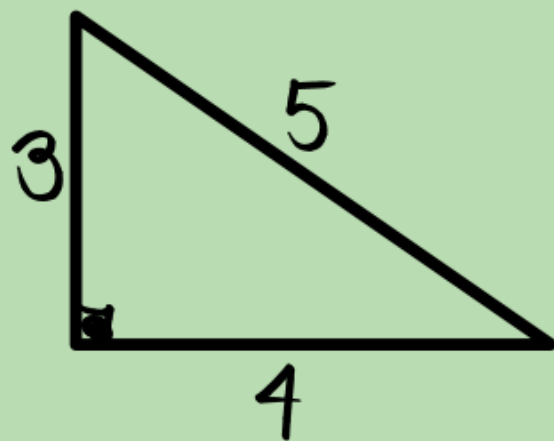
~~$$H = 13$$~~

Multiplication and division of basic triplets results into other triplets

(मूल त्रिक के गुणन और विभाजन से अन्य त्रिक बनाये जा सकते हैं)

$$\begin{aligned} (3, 4, 5) &\xrightarrow{\times 2} (6, 8, 10) \xrightarrow{\times 2} (12, 16, 20) \\ (5, 12, 13) &\xrightarrow{\times 2} (10, 24, 26) \xrightarrow{\times 1.5} (15, 36, 39) \end{aligned}$$

(Handwritten red notes: $(9, 12, 15)$ is written below $(6, 8, 10)$. A red arrow labeled $\times 3$ points from $(5, 12, 13)$ to $(15, 36, 39)$.)

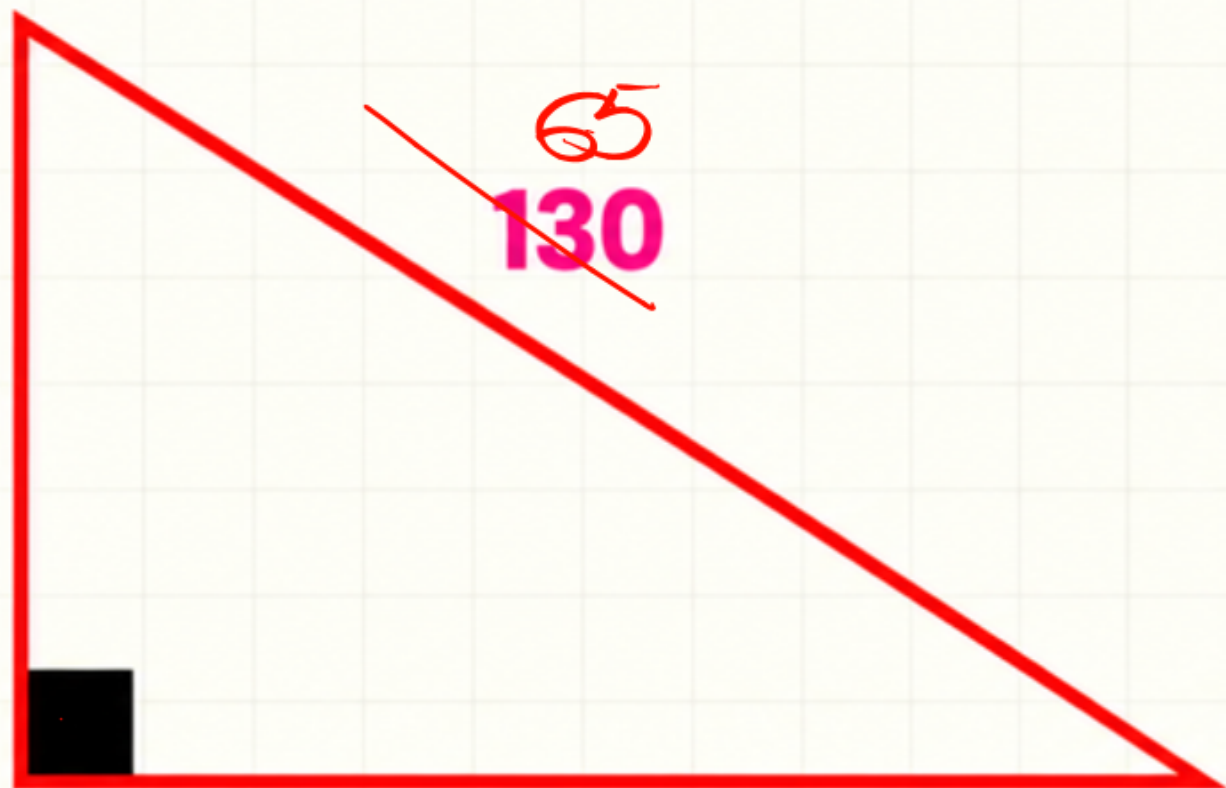


$$a^2 + b^2 = c^2$$

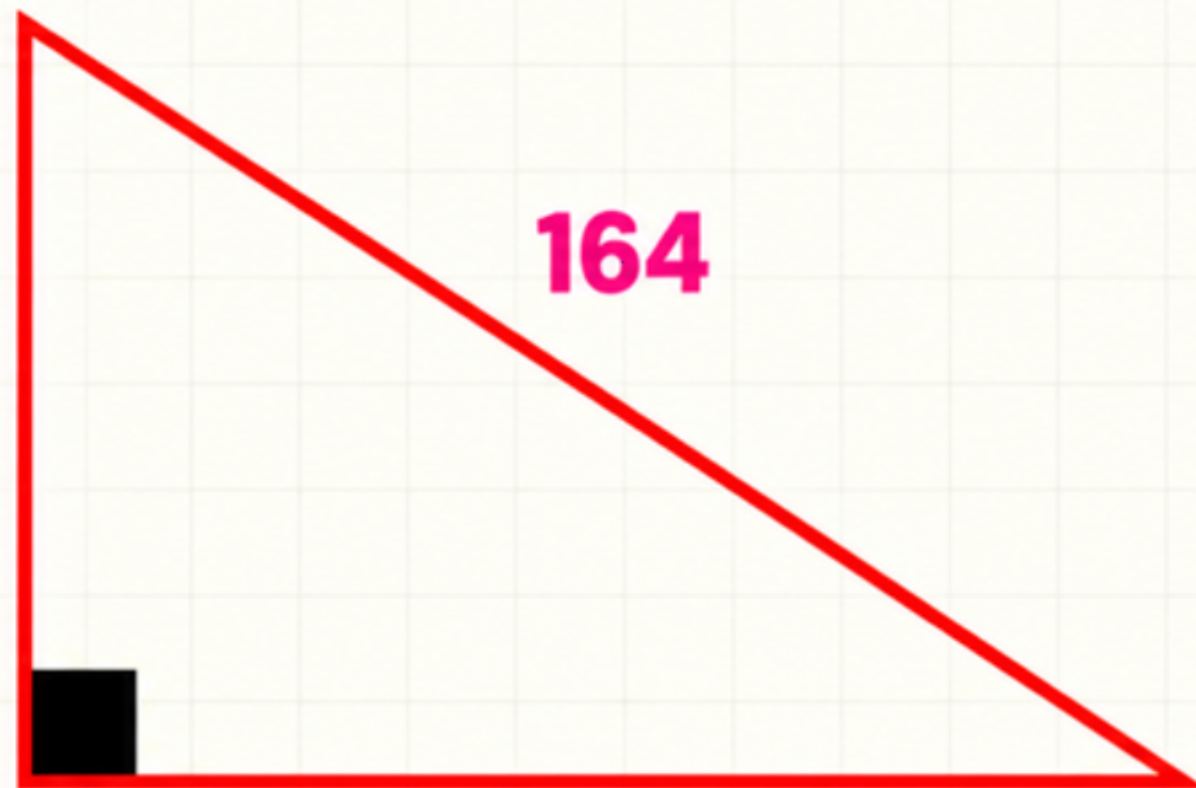


$$\sqrt{b^2 + b^2} = \sqrt{c}$$

$$(x+y)^2$$

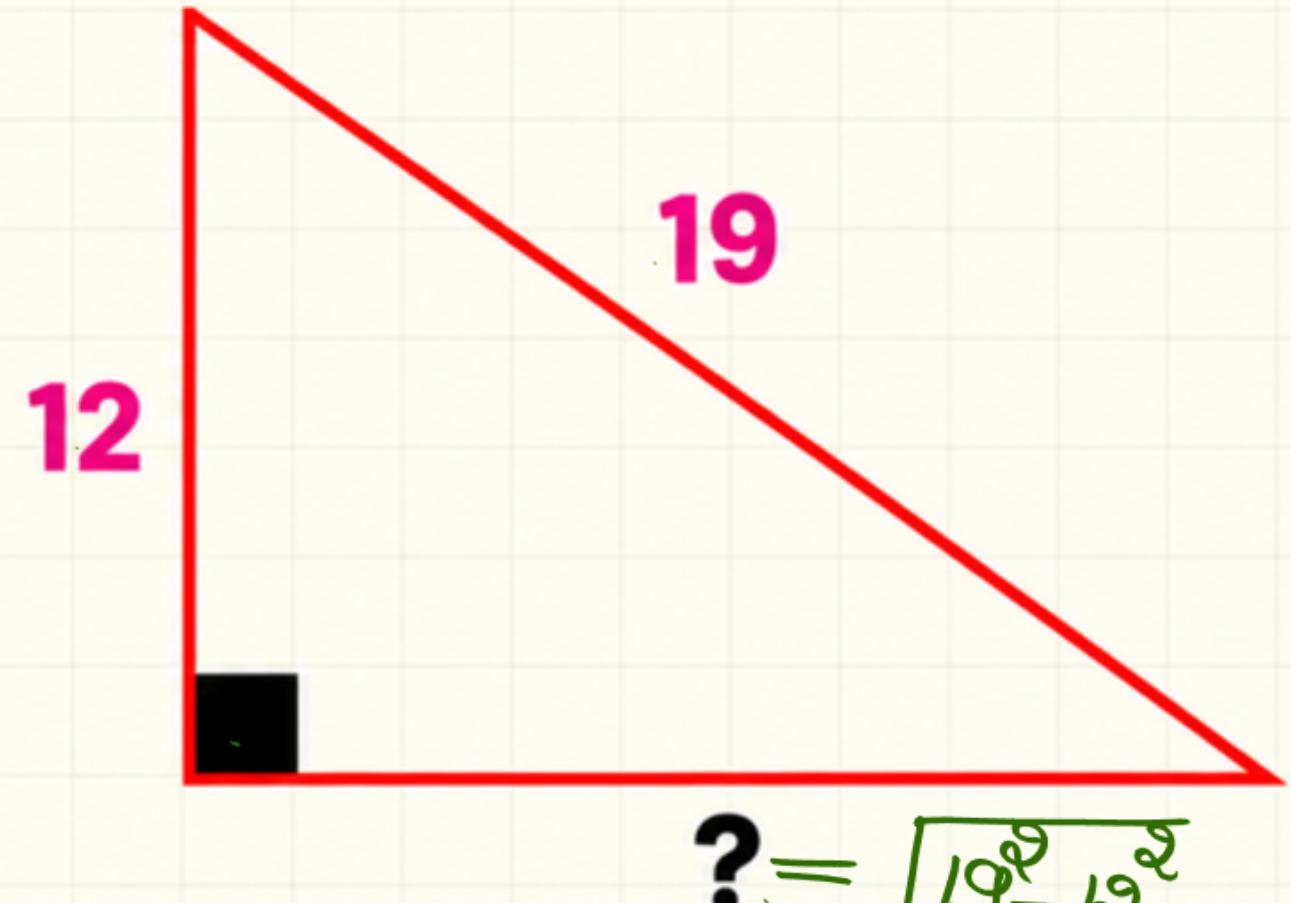
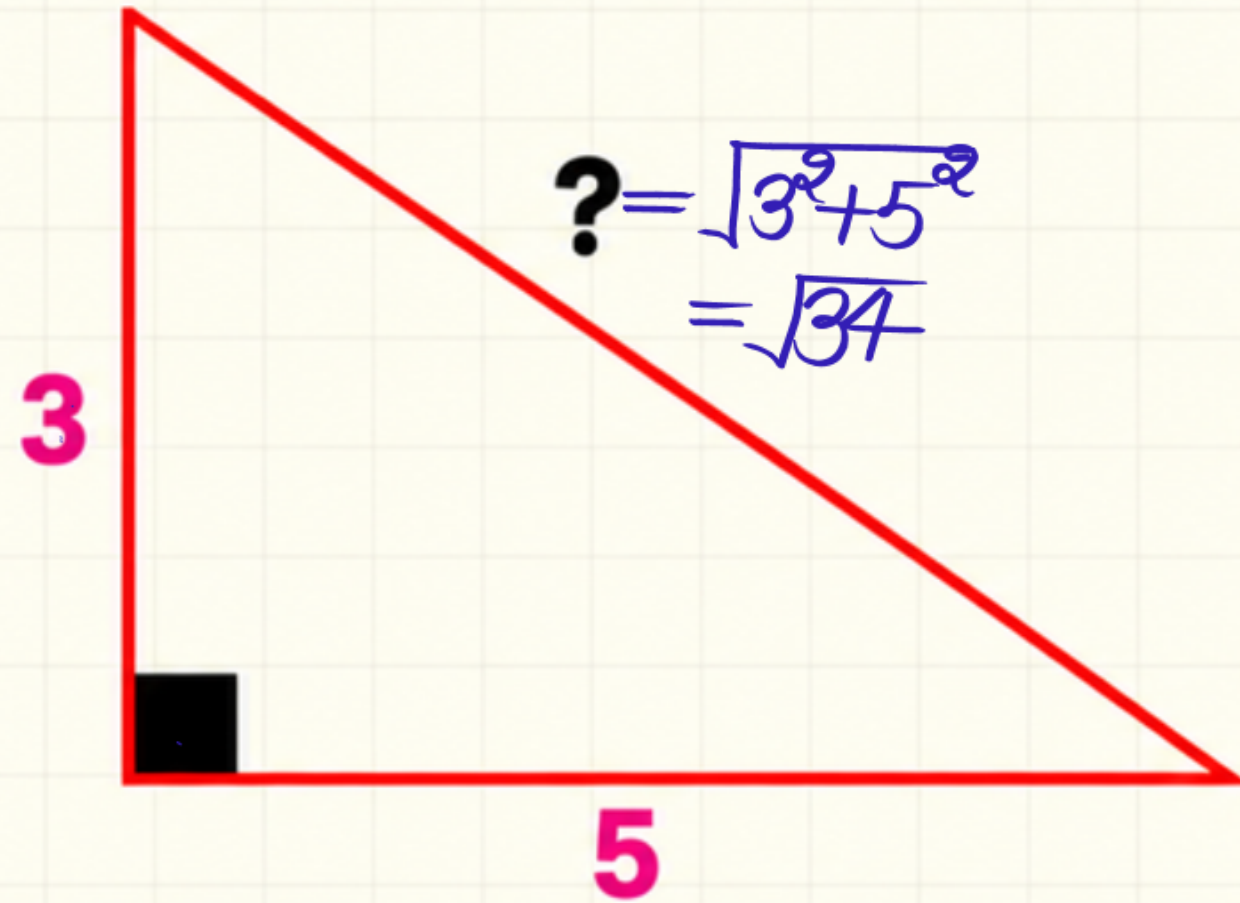


$$36 = ?$$

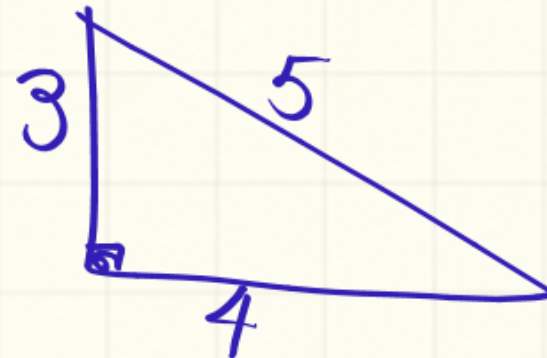


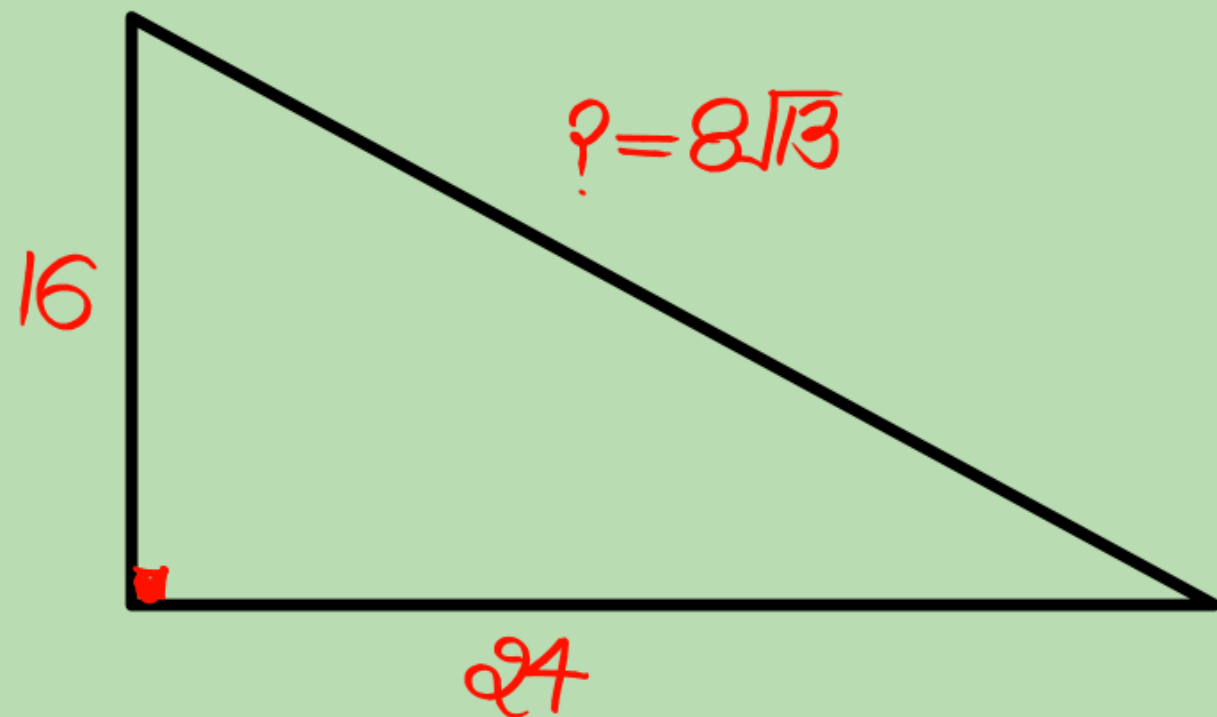
$$\div 4$$

$$(9, 40, 41)$$



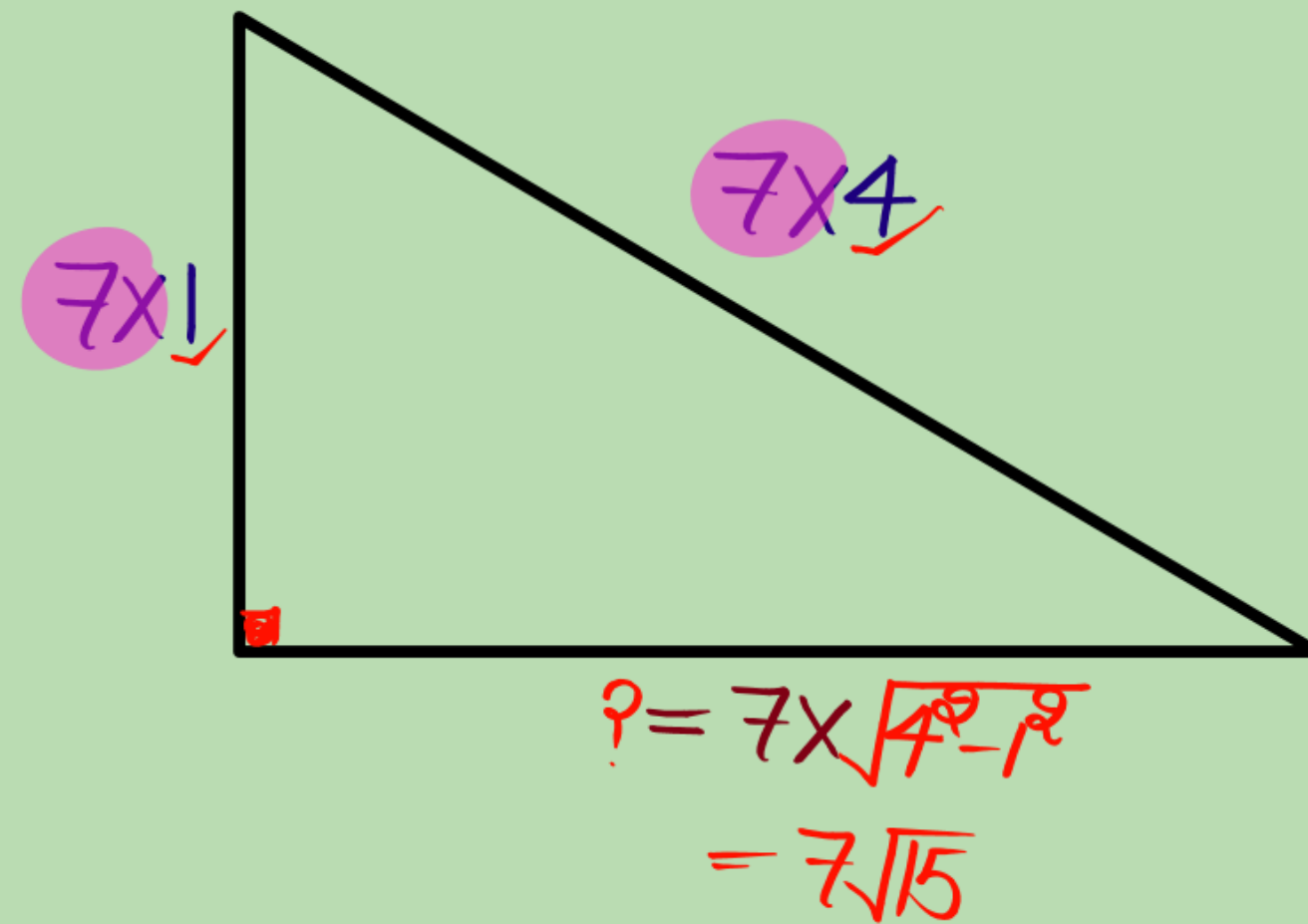
$(3, 4, 5)$
 ↓
 longest side





$\div 8$

$(2, 3, \sqrt{13})$

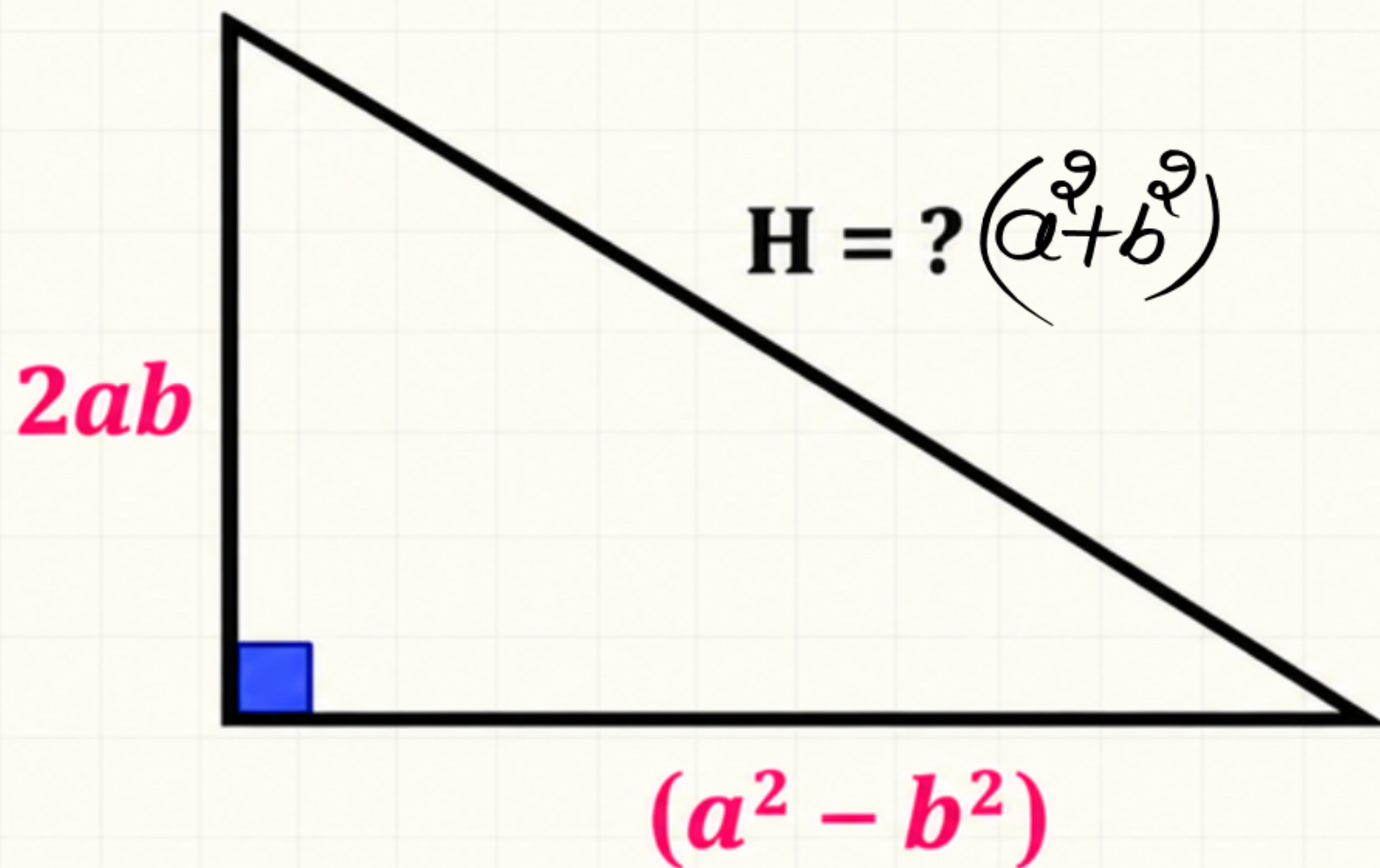


$$a^2 + b^2 = c^2$$



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

$$(x+y)^2$$

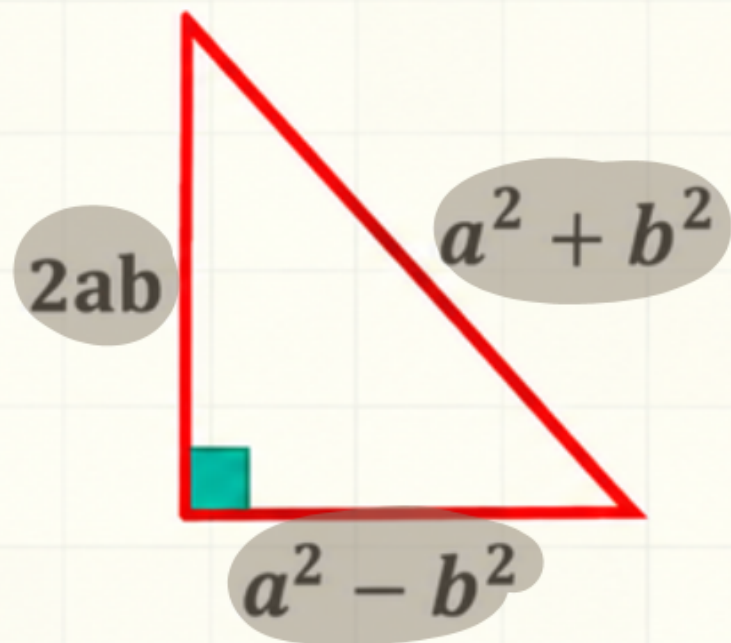


$$H = \sqrt{(a^2 - b^2)^2 + (2ab)^2}$$

$$= \sqrt{a^4 + b^4 - 2a^2b^2 + 4a^2b^2}$$

$$= \sqrt{a^4 + b^4 + 2a^2b^2}$$

$$= \sqrt{(a^2 + b^2)^2}$$
$$= a^2 + b^2$$



H

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

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

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

$$a \rightarrow x$$

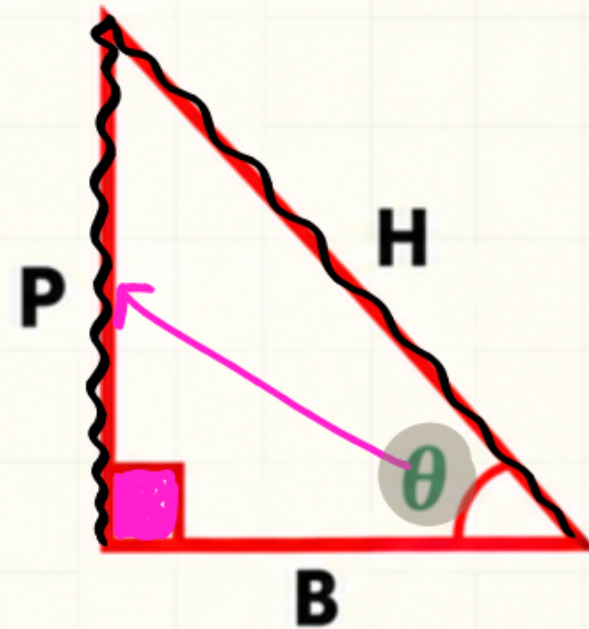
$$b \rightarrow 1$$

$$a \rightarrow x$$

$$b \rightarrow y$$

TRIGNOMETRIC RATIO:

~~$\frac{LAL}{KKA}$~~ ~~$\frac{PBP}{HHB}$~~



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

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

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

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

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

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

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

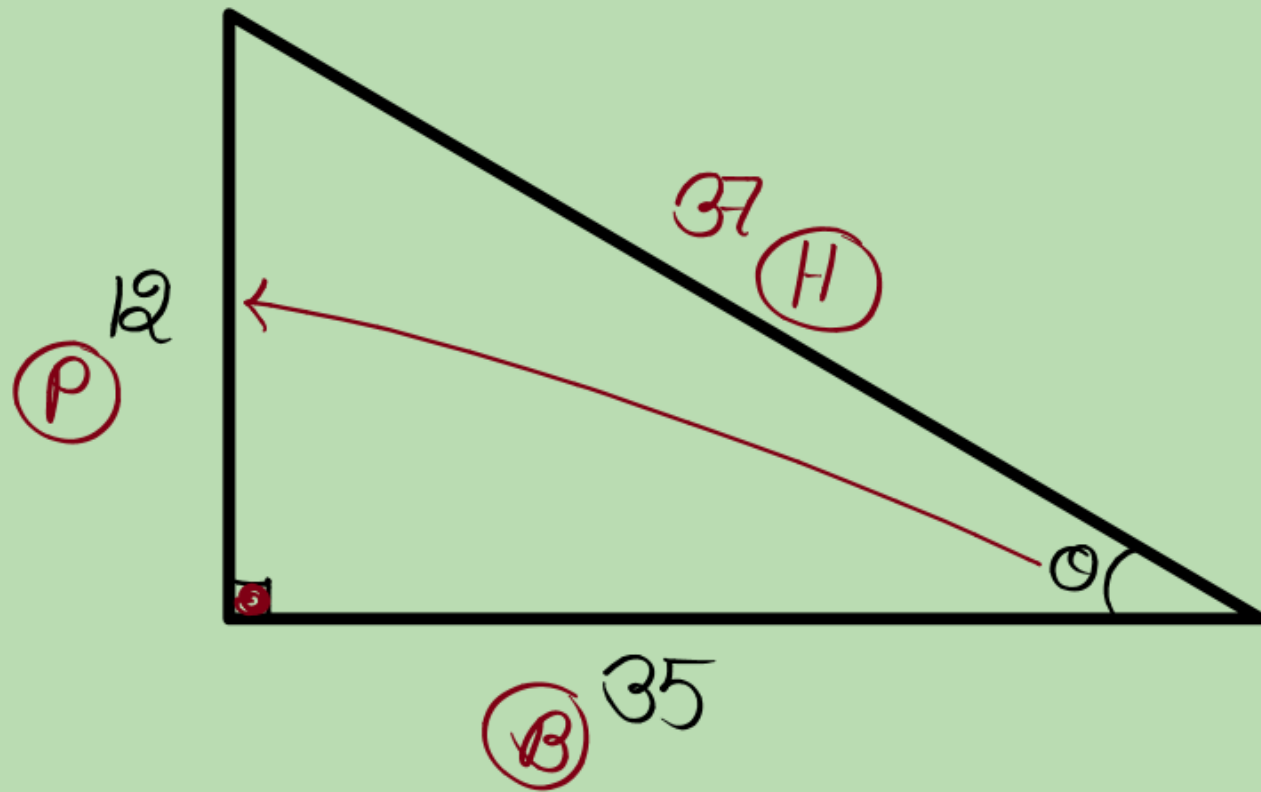
या $\operatorname{cosec} \theta = \frac{1}{\sin \theta} \rightarrow \sin \theta \times \operatorname{cosec} \theta = 1$

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

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

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

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



$$\sin \theta = \frac{12}{37}$$

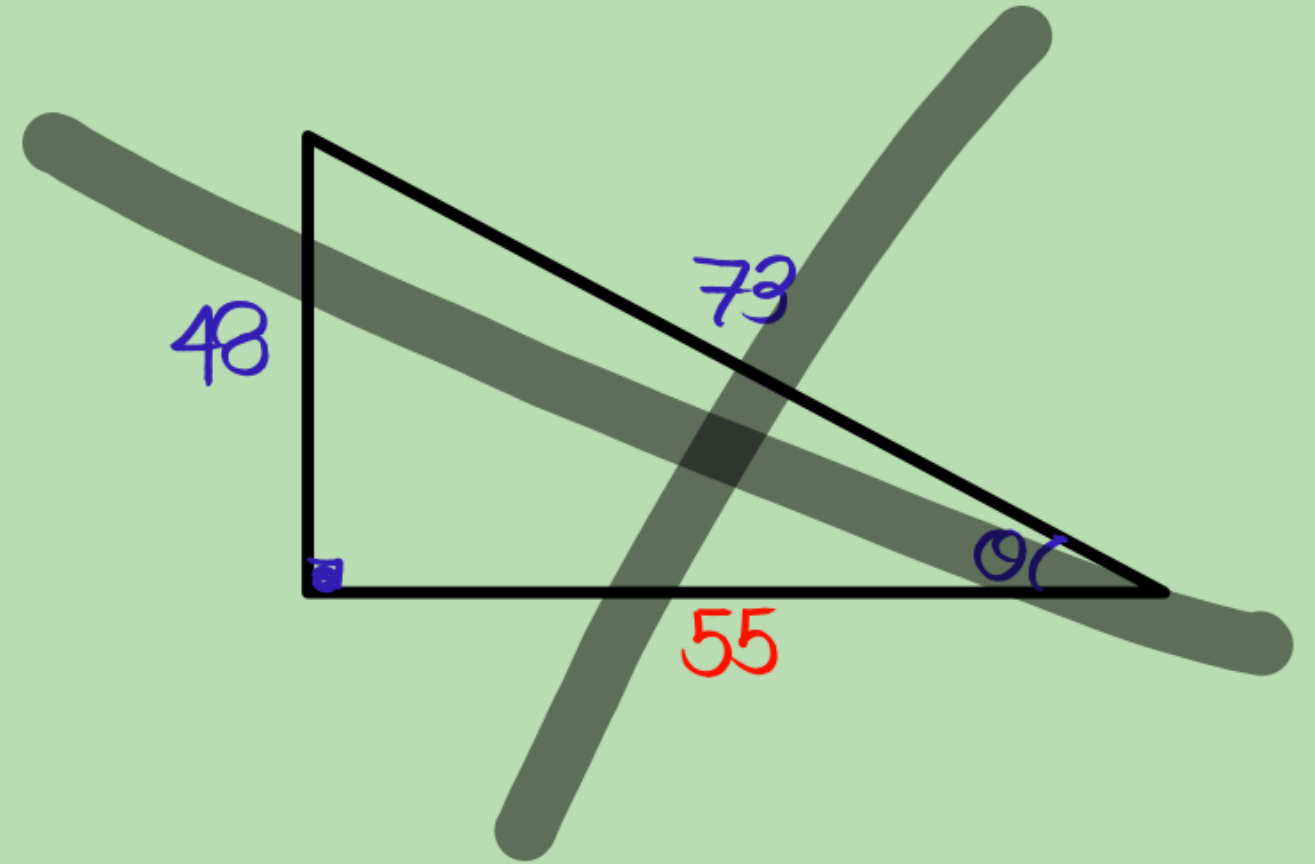
$$\cos \theta = \frac{35}{37}$$

$$\tan \theta = \frac{12}{35}$$

$$\sec \theta = \frac{37}{35}$$

$$\csc \theta =$$

यदि $\sin \theta = \frac{48}{73} \rightarrow \begin{matrix} P \\ H \end{matrix}$



तो $\tan \theta = \frac{P}{B} = \frac{48}{55}$

$$\tan \theta = \frac{P}{B} = \frac{\left(\frac{P}{H}\right)}{\left(\frac{B}{H}\right)} = \frac{\sin \theta}{\cos \theta} = \frac{\sec \theta}{1}$$

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



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] $\frac{1}{21}$

#

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

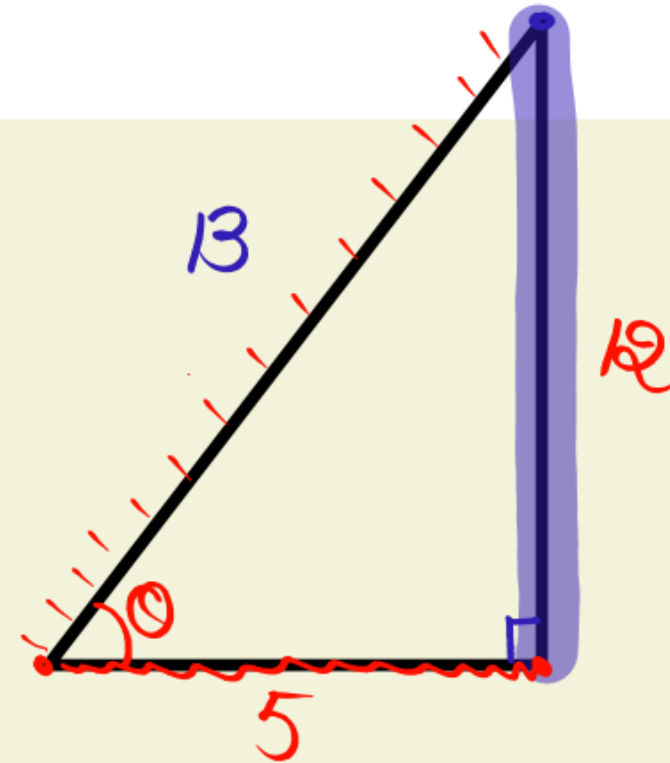
2. A ladder 13 m long leans against a wall. The foot of the ladder is 5 m from the wall. What is $\sin \theta$, where θ is the angle between the ladder and the ground?

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] $\frac{5}{3}$

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

