

कक्षा - 10

गणित

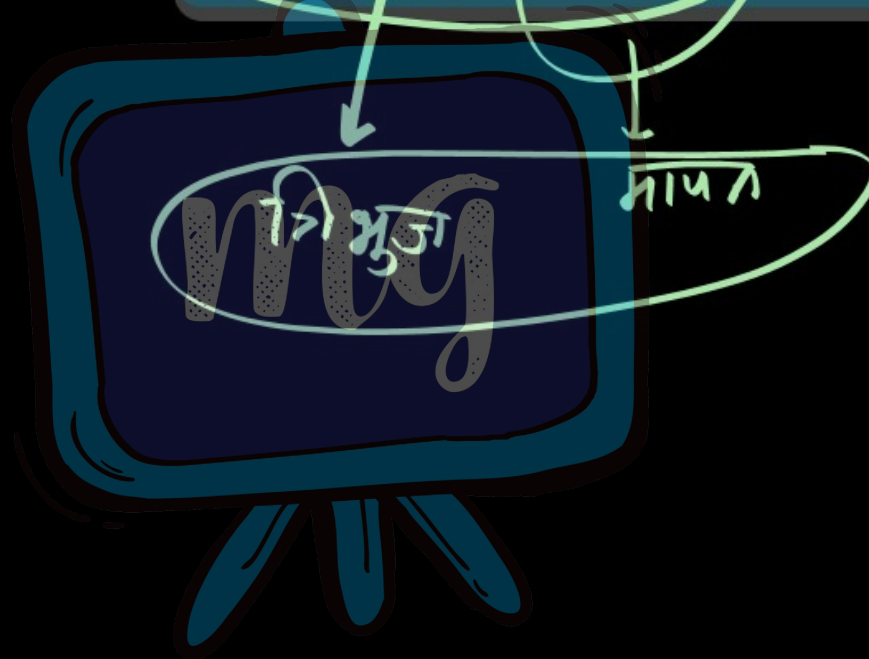
अध्याय - 8

त्रिकोणमिति का परिचय

भाग - 1

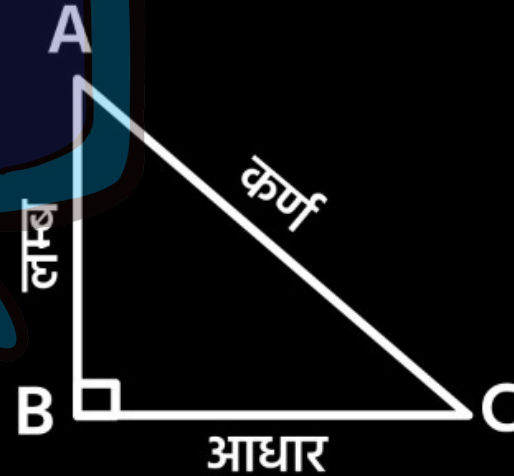
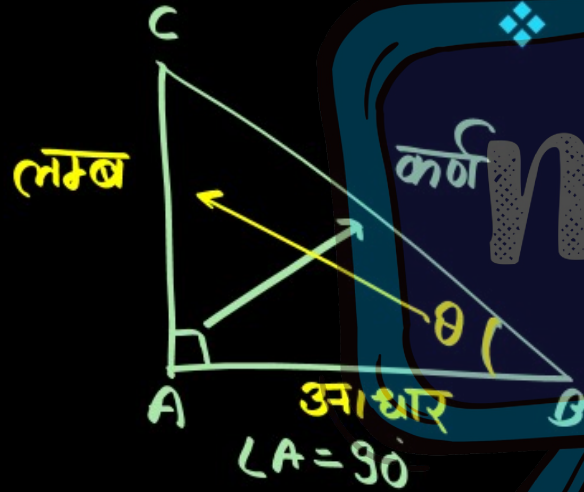
केशव शर्मा

त्रिकोणमिति का परिचय

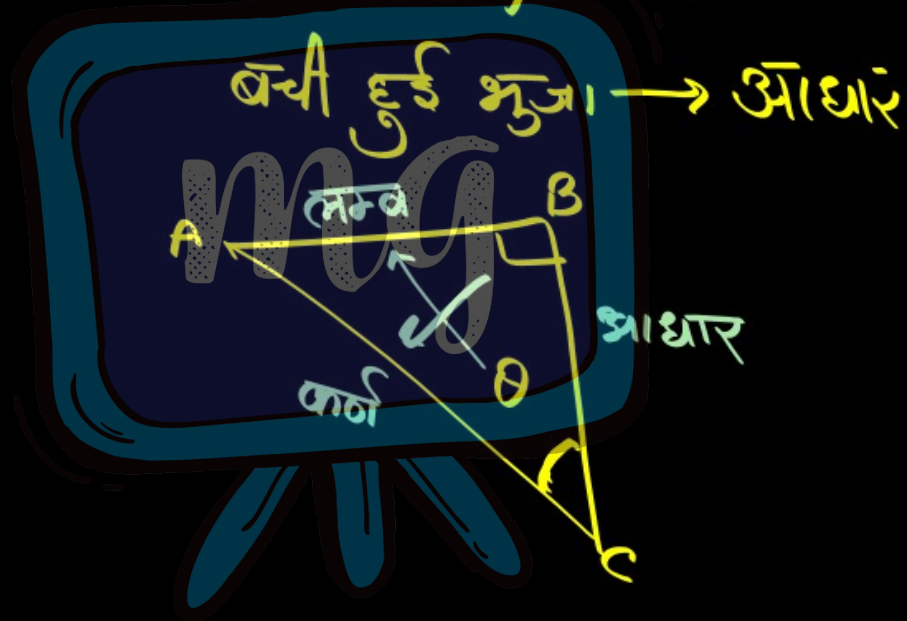


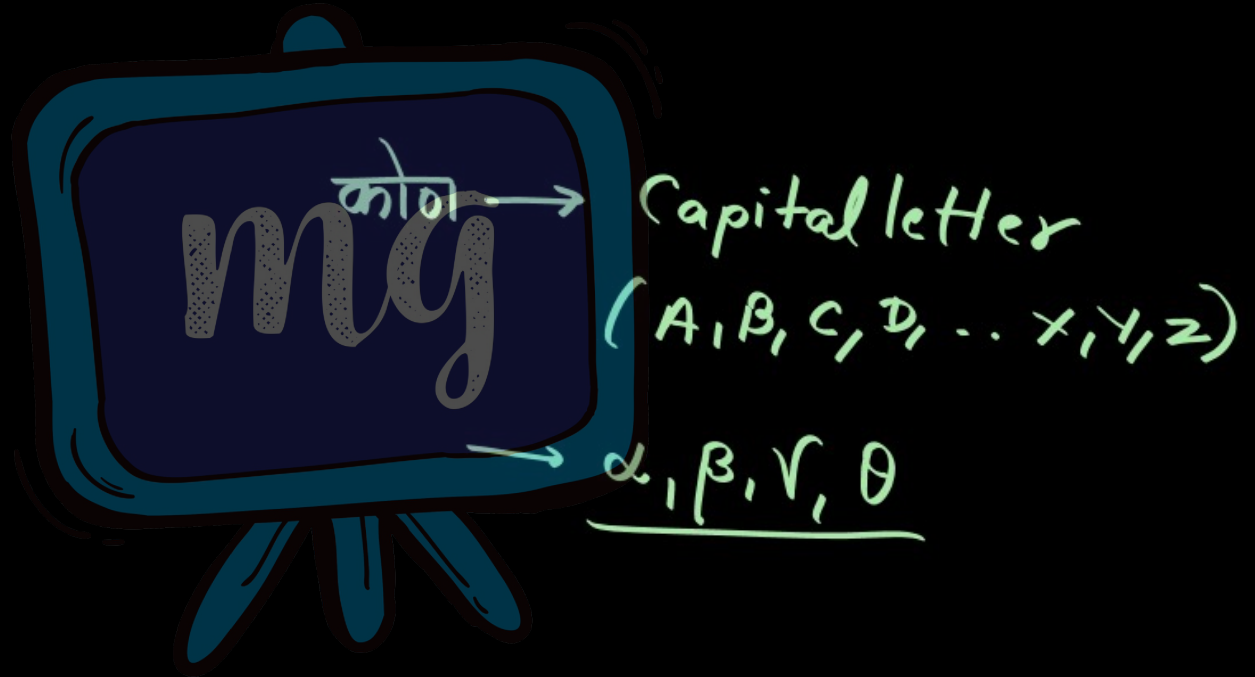
समकोण त्रिभुज

❖ एक त्रिभुज समकोण त्रिभुज कहलाता है यदि इसमें एक कोण समकोण (90°) हो।



90° के सामने $\rightarrow$ कोण
कोण (θ) के सामने $\rightarrow$ लम्ब





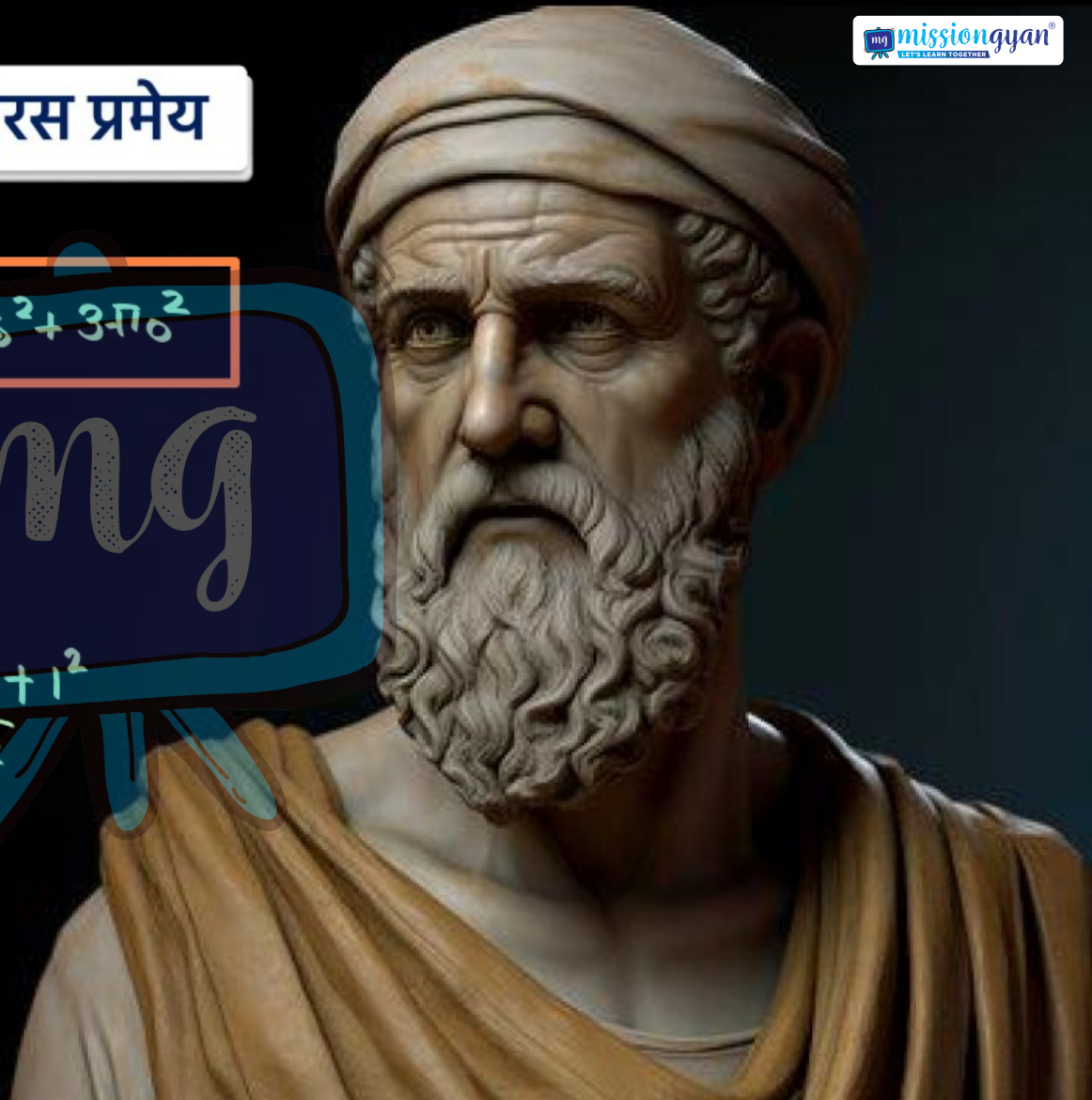
पाइथागोरस प्रमेय

$$\text{कर्ण}^2 = \text{लंब}^2 + 3\text{आ}^2$$

$\frac{p}{q}$ mg

$$\text{कर्ण}^2 = 1^2 + 1^2$$

$$\text{कर्ण} = \sqrt{2}$$



पाइथागोरस प्रमेय

$$\text{कर्ण}^2 = (\text{लम्ब})^2 + (\text{आधार})^2$$

❖ समकोण त्रिभुज में,

1. समकोण के सम्मुख भुजा सबसे बड़ी भुजा होती है तथा इसे **कर्ण** कहते हैं।

2. समकोण त्रिभुज दोनों अन्य भुजाएँ क्रमशः
लम्ब तथा आधार कहलाती हैं।

उदाहरण -

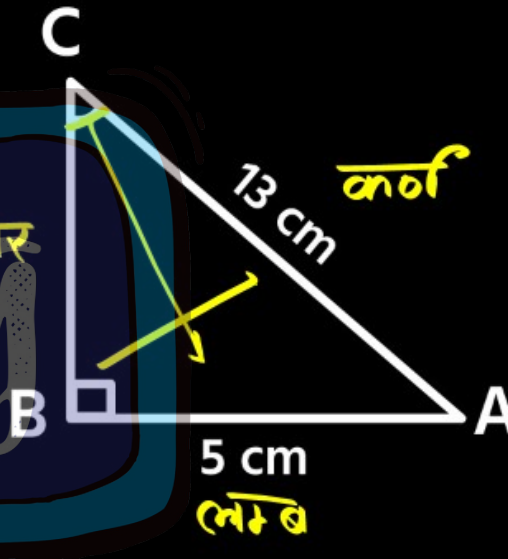
कॉर्न = लंब.² + आ.² आधार

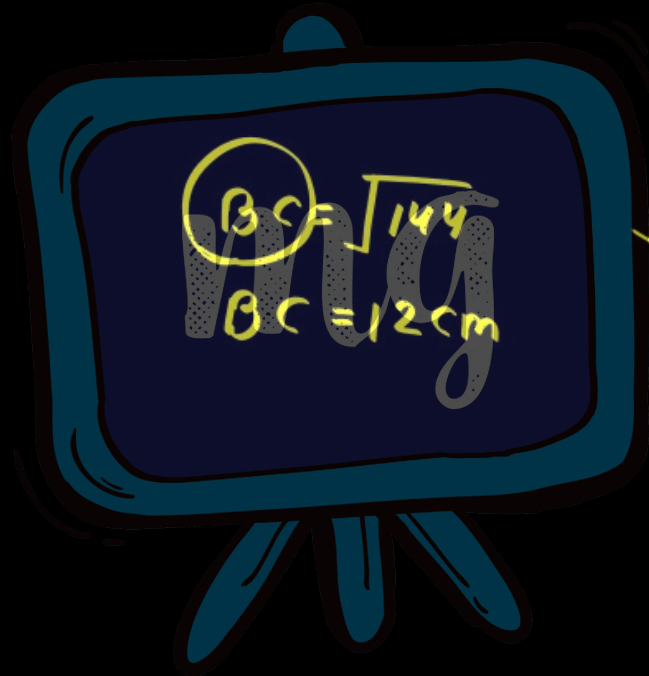
$AC^2 = BC^2 + AB^2$

$(13)^2 = BC^2 + 5^2$

$169 - 25 = BC^2$

$144 = BC^2$





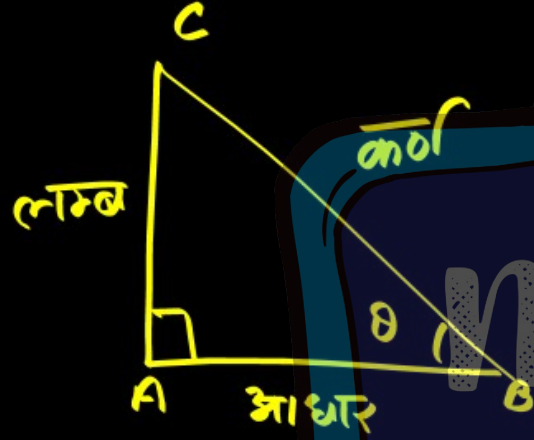
BC = $\sqrt{144}$
BC = 12 cm

$12^2 + 5^2 = 13^2$
 $(5, 12) \quad \underline{13}$

पाइथागोरस त्रिक



ત્રિકોણમિતીય અનુપાત



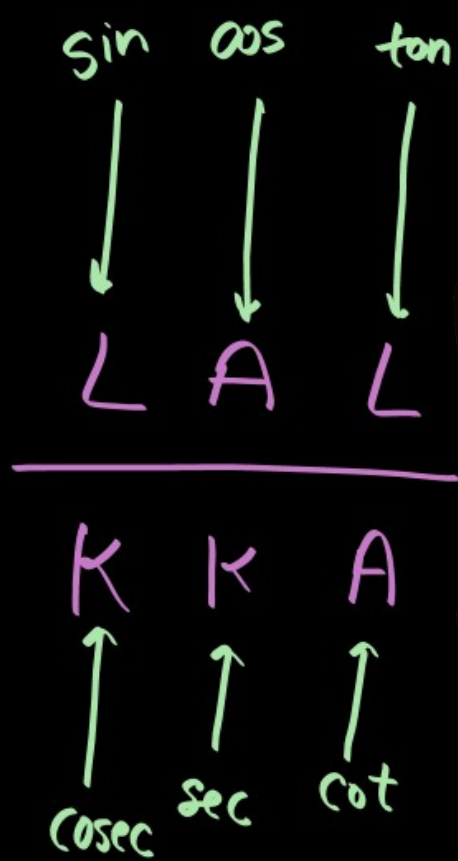
Sin/cos/tan

cot/sec/cosec

લમ્બ / કર્ણ / આધાર

$\frac{\text{લમ્બ}}{\text{કર્ણ}}$, $\frac{\text{આધાર}}{\text{કર્ણ}}$, $\frac{\text{લમ્બ}}{\text{આધાર}}$, $\frac{\text{આ.}}{\text{લ.}}$

$\frac{\text{કર્ણ}}{\text{આ.}}$, $\frac{\text{કર્ણ}}{\text{લ.}}$



(ज्या)

$$\sin \theta = \frac{\text{लम्ब}}{\text{कर्ण}}$$

(कोज्या)

$$\cos \theta = \frac{\text{आधार}}{\text{कर्ण}}$$

(सर्ज्या)

$$\tan \theta = \frac{\text{लम्ब}}{\text{आधार}}$$

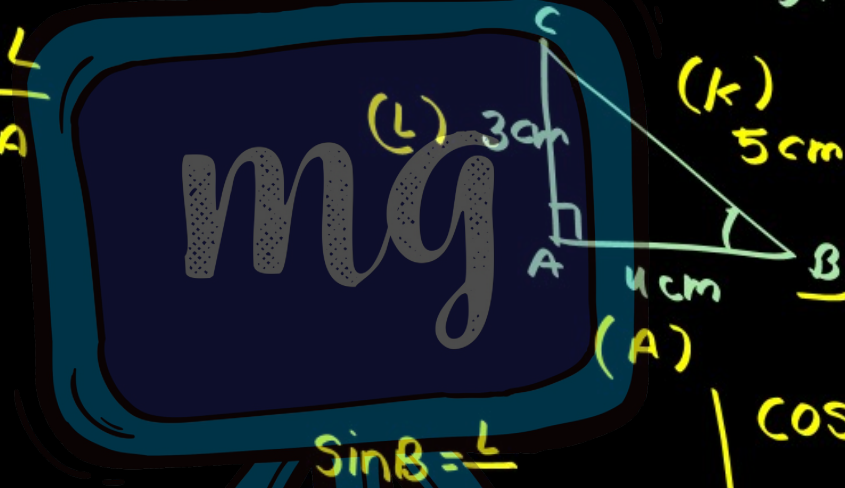
$$\cot \theta = \frac{\text{आधार}}{\text{लम्ब}}$$

$$\sec \theta = \frac{\text{कर्ण}}{\text{आधार}}$$

$$\csc \theta = \frac{\text{कर्ण}}{\text{लम्ब}}$$

Q. सभी त्रिकोणमितीय अनुपातों
का मान ज्ञात करो -

$$\frac{LAL}{KKA}$$



$$\sin B = \frac{L}{K}$$

$$\sin B = \frac{AC}{BC} = \frac{3}{5}$$

$$\cos B = \frac{A}{K}$$

$$\cos B = \frac{AB}{BC} = \frac{4}{5}$$

$$\begin{array}{c} \downarrow \\ \frac{LAL}{KKA} \\ \uparrow \uparrow \end{array}$$

$$\sec B = \frac{K}{A} = \frac{BC}{AB}$$

$$\sec B = \frac{5}{4}$$

$$\operatorname{cosec} B = \frac{K}{L} = \frac{BC}{AC}$$

$$\operatorname{cosec} B = \frac{5}{3}$$

$$\tan B = \frac{L}{A} = \frac{AC}{AB}$$

$$\tan B = \frac{3}{4}$$

$$\cot B = \frac{A}{L}$$

$$\cot B = \frac{AB}{AC} = \frac{4}{3}$$

$$\sin \theta = \frac{L}{k}$$

$$\operatorname{cosec} \theta = \frac{k}{L}$$

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

$$\frac{k}{L}$$

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

$$\sin \theta = \frac{1}{\left(\frac{k}{L}\right)}$$

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

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

इसी प्रकार

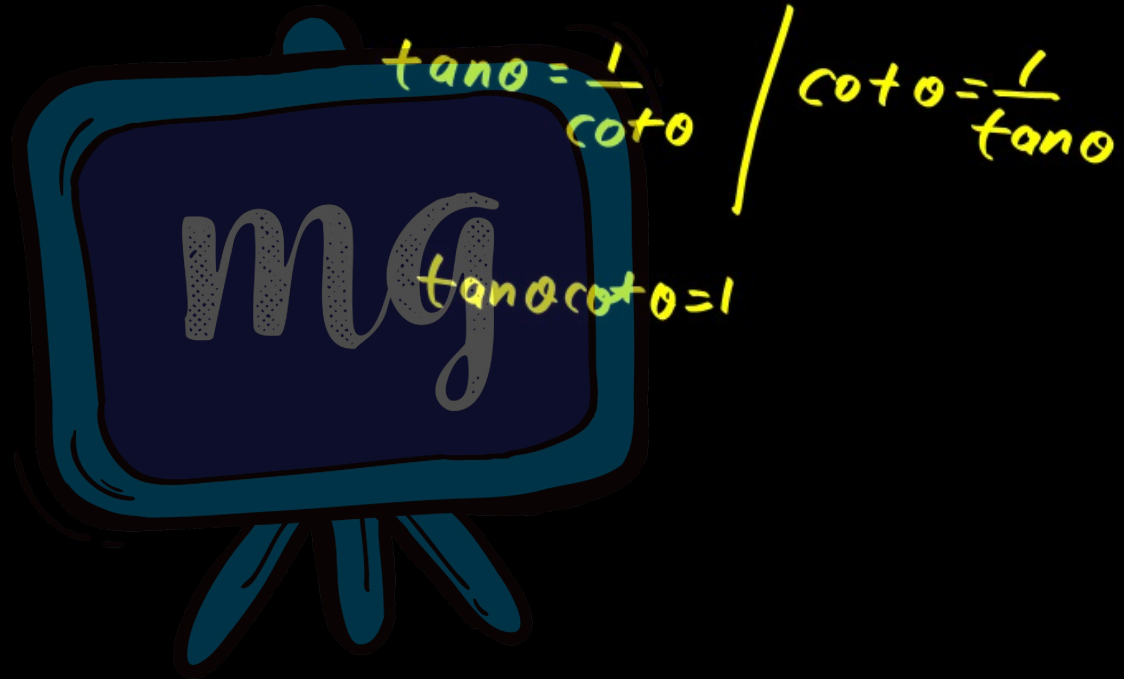
$$\cos \theta = \frac{A}{k}$$

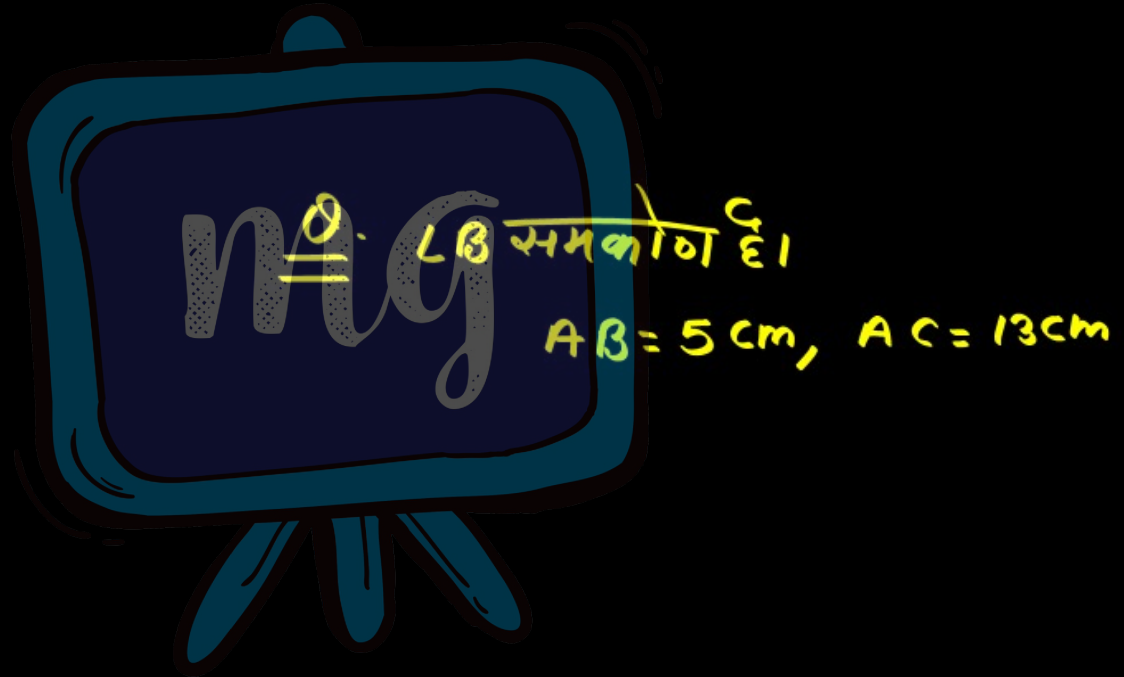
$$\cos \theta = \frac{\frac{A}{k}}{\frac{A}{A}} = \frac{1}{\frac{k}{A}}$$

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

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

$$\cos \theta \sec \theta = 1$$





त्रिकोणमितीय अनुपात निम्न 6 हैं –

1.

$$\frac{\text{sine}\theta/\sin \theta}{\text{कर्ण}} = \frac{\text{लम्ब}}{\text{कर्ण}}$$

2.

$$\frac{\text{cosine}\theta/\cos \theta}{\text{कर्ण}} = \frac{\text{आधार}}{\text{कर्ण}}$$

3.

$$\frac{\text{tangent}\theta/\tan \theta}{\text{आधार}} = \frac{\text{लम्ब}}{\text{आधार}}$$

4. $\frac{\text{Cotangent}\theta}{\cot\theta} = \frac{\text{आधार}}{\text{लम्ब}}$

5. $\frac{\text{secant}\theta}{\sec\theta} = \frac{\text{कर्ण}}{\text{आधार}}$

6. $\frac{\text{Cosecant}\theta}{\text{cosec}\theta} = \frac{\text{कर्ण}}{\text{लम्ब}}$