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Samagra Shiksha
সমগ্ৰ শিক্ষা

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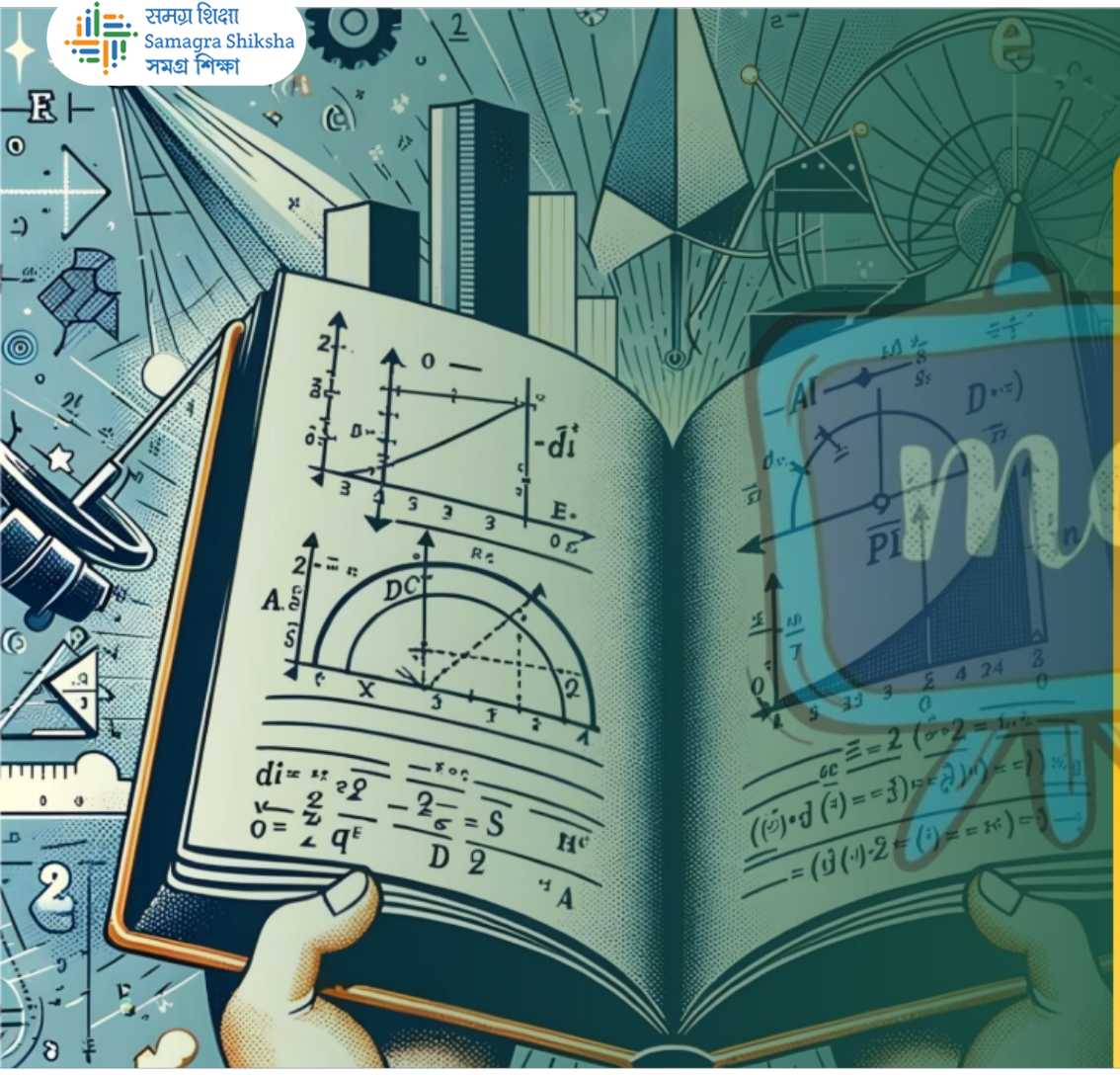

দশম শ্ৰেণীৰ বাবে

গণিত

অধ্যায় - ৮

ত্ৰিকোণমিতিৰ পৰিচয়

অংশ – ৩

অনুশীলনী- ৮.১

অন্তৰা বেনার্জী

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1. ΔABC ত্রিভুজৰ B কোণ সমকোণ আৰু AB = 24 cm, BC = 7 cm হ'লে তলত দিয়াবিলাক উলিওৱাঃ

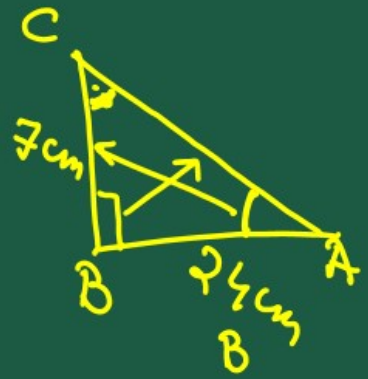
(i) **sin A, cos A**

পাইথাগোৰাছ উপপাদ্য প্ৰয়োগ কৰি

পাওঁ— $AC^2 = BC^2 + AB^2$

$\Rightarrow AC = \sqrt{BC^2 + AB^2}$

$= \sqrt{(7\text{cm})^2 + (24\text{cm})^2}$



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$= \sqrt{49\,cm^2 + 576\,cm^2}$

$= \sqrt{625\,cm^2}$

$AC = 25\,cm$

(i) $\sin A = \frac{BC}{AC} = \frac{7\,cm}{25\,cm} = \frac{7}{25}$

$\cos A = \frac{AB}{AC} = \frac{24\,cm}{25\,cm} = \frac{24}{25}$

$P = BC = 7cm$

$B = AB = 24cm$

$H = AC = 25\,cm$

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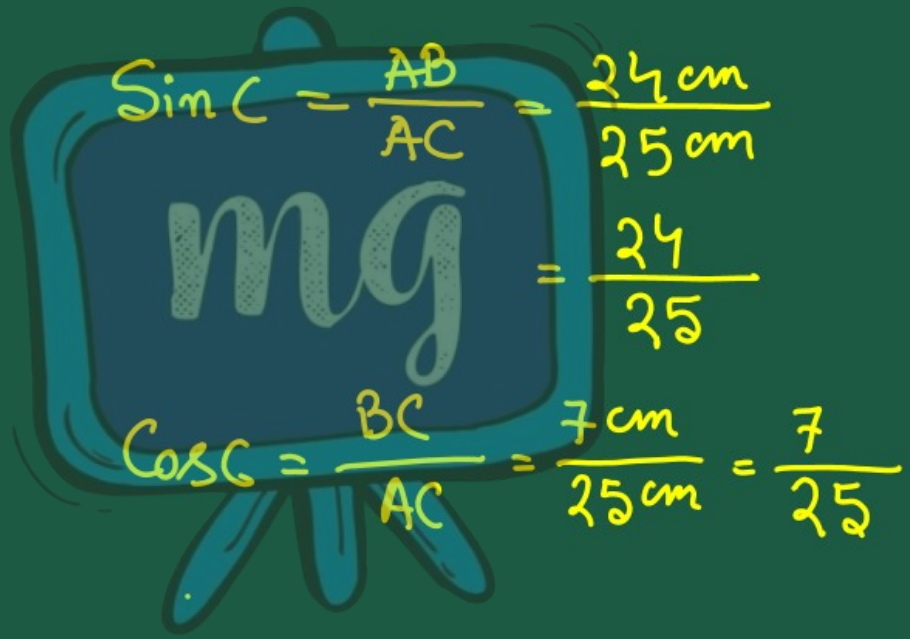
(ii) sin C, cos C



$$\sin C = \frac{AB}{AC} = \frac{24\,cm}{25\,cm} = \frac{24}{25}$$

$$\cos C = \frac{BC}{AC} = \frac{7\,cm}{25\,cm} = \frac{7}{25}$$

B = BC = 7cm
P = AB = 24cm
H = AC = 25cm

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2. চিত্ৰ ৰ পৰা tan P – cot R নিৰ্ণয় কৰা।

পাইথাগোৰাছ উপপাদ্য প্ৰয়োগ কৰি পাওঁ-

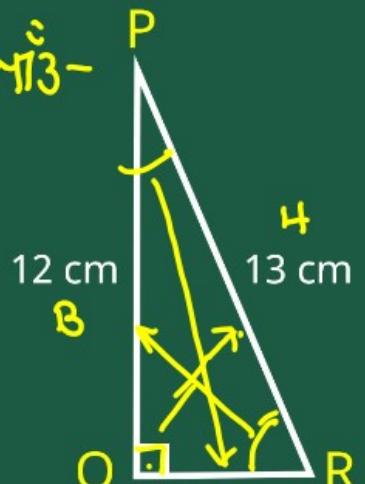
$$QR = \sqrt{PR^2 - PQ^2}$$

$$= \sqrt{(13\,cm)^2 - (12\,cm)^2}$$

$$= \sqrt{169\,cm^2 - 144\,cm^2}$$

$$= \sqrt{25\,cm^2}$$

$$= 5\,cm$$



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

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

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$$\tan P = \frac{QR}{PQ} = \frac{5\,cm}{12\,cm} = \frac{5}{12}$$

$$\cot R = \frac{QR}{PQ} = \frac{5\,cm}{12\,cm} = \frac{5}{12}$$

$$\therefore \tan P - \cot R = \frac{5}{12} - \frac{5}{12}$$

$$= 0$$

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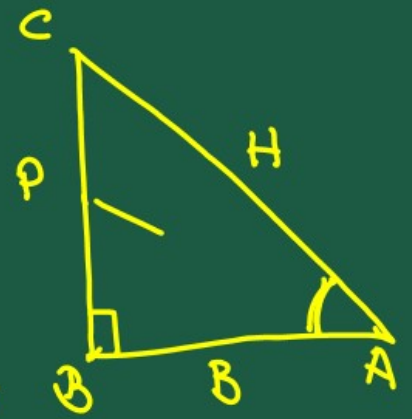
3. যদি $\sin A = \frac{3}{4}$ তেন্তে cosA আৰু tanA উলিওৱা।

দিয়া আছে, $\sin A = \frac{3}{4}$

$\Rightarrow \frac{BC}{AC} = \frac{3}{4}$

ধৰা হ'ল $\frac{BC}{AC} = \frac{3}{4} = k$ - k এটা ধনাত্মক সংখ্যা

$\Rightarrow BC = 3k$, $AC = 4k$



$\sin\theta = \frac{P}{H}$

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পাইথাগোরাস উপপাদ্য প্রয়োগ করি পাই-

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

$$\Rightarrow (4k)^2 = AB^2 + (3k)^2$$

$$\Rightarrow 16k^2 = AB^2 + 9k^2$$

$$\Rightarrow AB^2 = 16k^2 - 9k^2$$

$$\Rightarrow AB = \sqrt{7k^2}$$

$$= \sqrt{7}k$$

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$B = AB = \sqrt{7}k$, $P = BC = 3k$, $H = AC = 4k$

$$\cos A = \frac{AB}{AC} = \frac{\sqrt{7}k}{4k} = \frac{\sqrt{7}}{4}$$

$$\tan A = \frac{BC}{AB} = \frac{3k}{\sqrt{7}k} = \frac{3}{\sqrt{7}}$$

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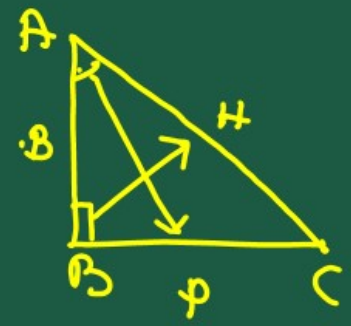
4. দিয়া আছে যে, 15 cotA = 8, তেন্তে sinA আৰু secA উলিওৱা।

$15\cot A = 8$

$\Rightarrow \cot A = \frac{8}{15}$

$\Rightarrow \frac{AB}{BC} = \frac{8}{15}$



ধৰা হ'ল $\frac{AB}{BC} = \frac{8}{15} = k$, k এটা ধনাত্মক সংখ্যা,

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

$\Rightarrow AB = 8k,\ BC = 15k$

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পাইথাগোরাস উপপাদ্য প্রয়োগ করি পাই -

$$AC = \sqrt{AB^2 + BC^2}$$

$$= \sqrt{(8k)^2 + (15k)^2}$$

$$= \sqrt{64k^2 + 225k^2}$$

$$= \sqrt{289k^2}$$

$$= \sqrt{289}\ k$$

$$= 17k$$

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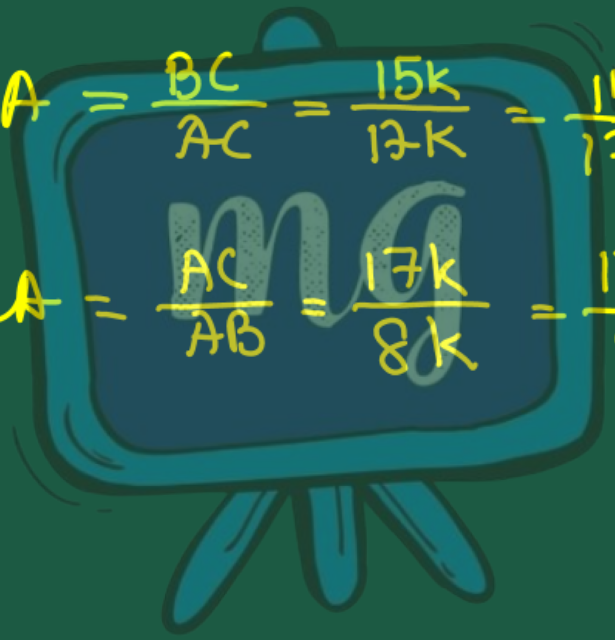

$$\sin A = \frac{BC}{AC} = \frac{15k}{17k} = \frac{15}{17}$$

$$\sec A = \frac{AC}{AB} = \frac{17k}{8k} = \frac{17}{8}$$

P = BC = 15k

B = AB = 8k

H = AC = 17k