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Samagra Shiksha
সমগ্ৰ শিক্ষা

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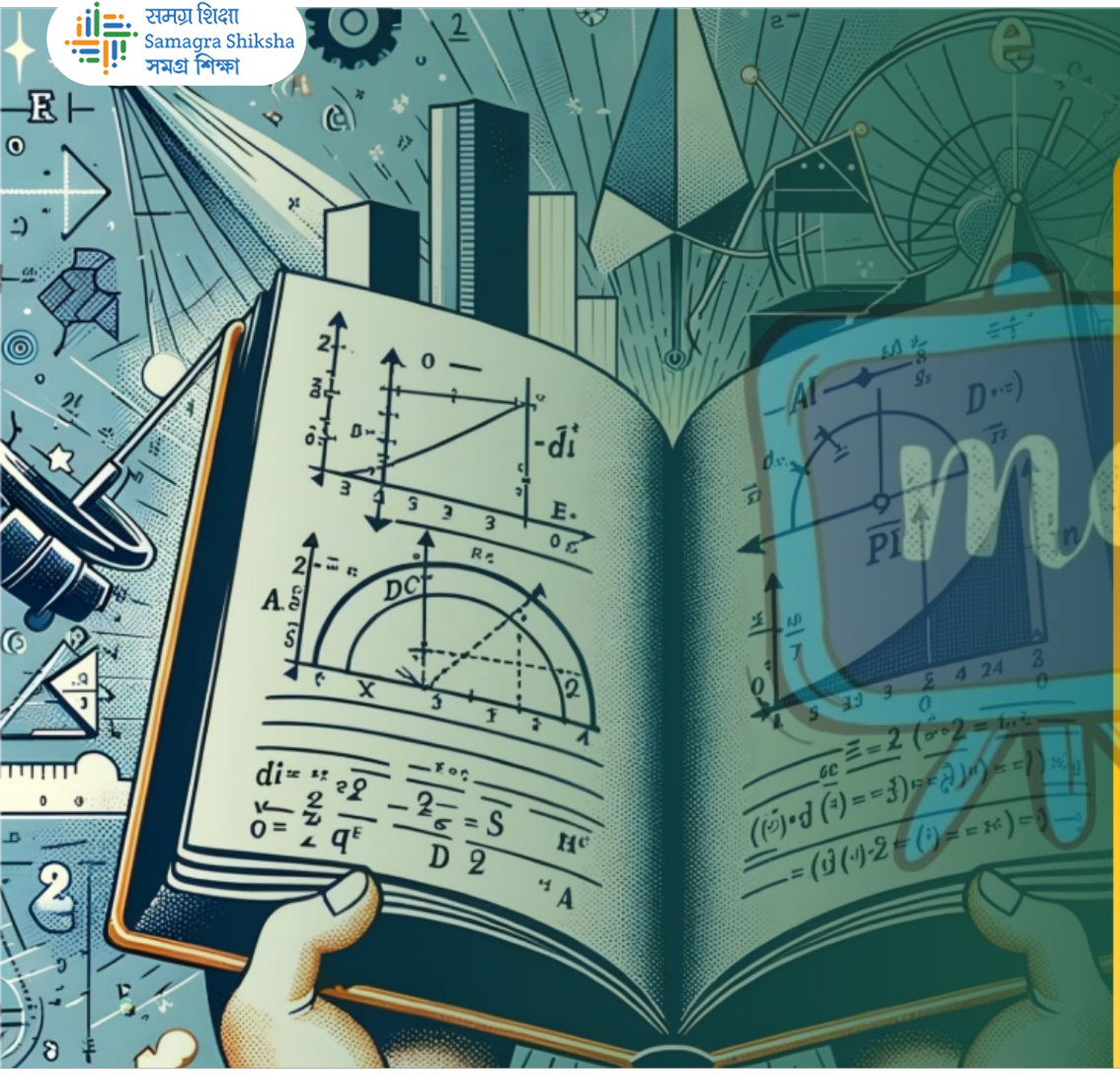


দশম শ্ৰেণীৰ বাবে

গণিত

অধ্যায় - ৮

ত্ৰিকোণমিতিৰ পৰিচয়

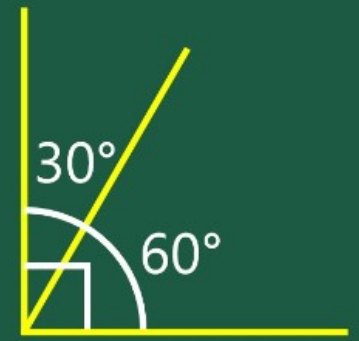
অংশ – ৮

পূৰক কোণৰ ত্ৰিকোণমিতিক অনুপাত

অন্তৰা বেনার্জী

পৰিপূৰক কোণ

দুটা কোণৰ যোগফল 90° হ'লে কোণ দুটাক পূৰক কোণ বুলি কোৱা হয়।



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পূৰক কোণৰ ত্ৰিকোণমিতিক অনুপাত

- $\sin(90° - A) = \cos A$
- $\cos(90° - A) = \sin A$
- $\tan(90° - A) = \cot A$
- $\cot(90° - A) = \tan A$
- $\sec(90° - A) = \operatorname{cosec} A$
- $\operatorname{cosec}(90° - A) = \sec A$

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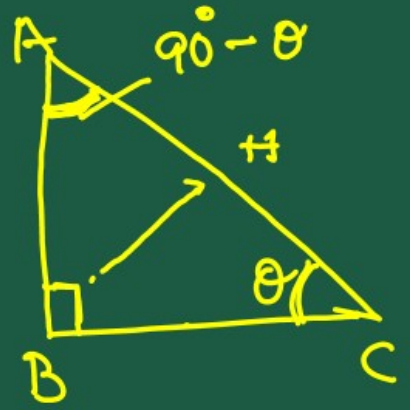
$$\sin\theta = \frac{AB}{AC}$$

$$\cos(90^\circ - \theta) = \frac{AB}{AC}$$

$$\cos(90^\circ - \theta) = \sin\theta$$

$$\sin(90^\circ - \theta) = \frac{BC}{AC} \quad \checkmark \quad \cos\theta = \frac{BC}{AC} \quad \checkmark$$

$$\sin(90^\circ - \theta) = \cos\theta$$



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

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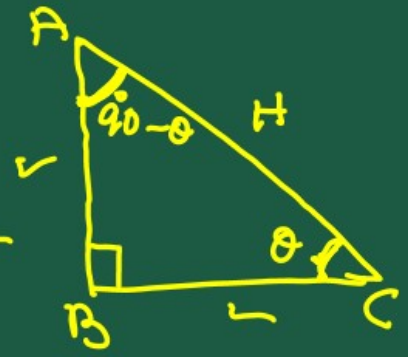
$$\tan(90^\circ - \theta) = \frac{BC}{AB} \quad | \quad \cot\theta = \frac{BC}{AB}$$

$$\tan(90^\circ - \theta) = \cot\theta$$

$$\tan\theta = \frac{AB}{BC} \quad | \quad \cot(90^\circ - \theta) = \frac{AB}{BC}$$

$$\tan\theta = \cot(90^\circ - \theta)$$



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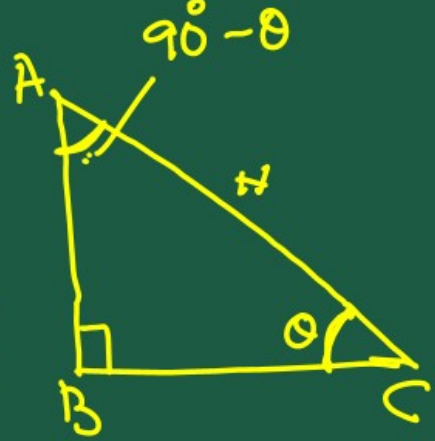
$$\sec(90^\circ-\theta)=\frac{AC}{AB} \quad \text{cosec}\,\theta=\frac{AC}{AB}$$

$$\sec(90^\circ-\theta)=\text{cosec}\,\theta$$

$$\sec\theta=\frac{AC}{BC} \quad \text{cosec}(90^\circ-\theta)=\frac{AC}{BC}$$

$$\sec\theta=\text{cosec}(90^\circ-\theta)$$



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উদাহৰণ - 9

$\frac{\tan 65^\circ}{\cot 25^\circ}$ ৰ মান উলিওৱা।

$= \frac{\tan(90^\circ - 25^\circ)}{\cot 25^\circ}$

$= \frac{\cot 25^\circ}{\cot 25^\circ}$

$= 1$

$\tan(90^\circ - A) = \cot A$

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উদাহৰণ - 10

যদি $\sin 3A = \cos (A - 26°)$, য'ত 3A সূক্ষ্ম কোণ, তেন্তে A উলিওৱা।

আমি জানো, $\cos(90° - A) = \sin A$

$\sin 3A = \cos(A - 26°)$

$\Rightarrow \cos(90° - 3A) = \cos(A - 26°)$

$\Rightarrow 90° - 3A = A - 26°$

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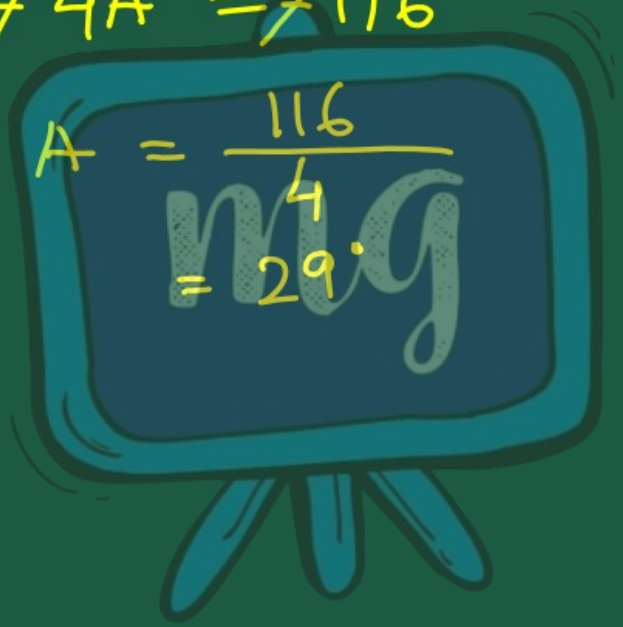
$$-3A - A = -26^\circ - 90^\circ$$

$$\Rightarrow -4A = -116$$

$$\Rightarrow A = \frac{116}{4}$$

$$= 29^\circ$$



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উদাহৰণ - 11

cot 85° + cos75° ক 0° আৰু 45° কোণৰ মাজৰ ত্ৰিকোণমিতিক অনুপাতত প্ৰকাশ কৰা।

$$\cot 85^\circ + \cos 75^\circ$$

$$= \cot(90^\circ - 5^\circ) + \cos(90^\circ - 15^\circ)$$

$$= \tan 5^\circ + \sin 15^\circ$$

$\cot(90^\circ - A) = \tan A$

$\cos(90^\circ - A) = \sin A$


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অনুশীলনী ৪.3

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1. মান নির্ণয় কৰা —

(i) $\dfrac{\sin 18^\circ}{\cos 72^\circ}$

$= \dfrac{\sin(90^\circ - 72^\circ)}{\cos 72^\circ}$

$= \dfrac{\cos 72^\circ}{\cos 72^\circ}$

$= 1$

$\sin(90^\circ - A) = \cos A$

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1. মান নির্ণয় কৰা —

(ii) $\dfrac{\tan 26^\circ}{\cot 64^\circ}$

$= \dfrac{\tan 26^\circ}{\cot(90^\circ - 26^\circ)}$

$\cot(90^\circ - A) = \tan A$

$= \dfrac{\tan 26^\circ}{\tan 26^\circ}$

$= 1$

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1. মান নির্ণয় কৰা —

(iii) $\cos 48^\circ - \sin 42^\circ$

$= \cos(90^\circ - 42^\circ) - \sin 42^\circ$

$= \sin 42^\circ - \sin 42^\circ$ | $\cos(90^\circ - A) = \sin A$

$= 0$

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1. মান নির্ণয় কৰা —

(iv) cosec 31° – sec 59°

$= \text{Cosec}(90° - 59°) - \text{Sec}\,59°$

$= \text{Sec}\,59° - \text{Sec}\,59°$ | $\text{Cosec}(90° - A) = \text{Sec}\,A$

$= 0$

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1. মান নির্ণয় কৰা —

(v) $\sin 35^\circ \sin 55^\circ - \cos 35^\circ \cos 55^\circ$

$\sin(90^\circ - A) = \cos A$

$= \sin(90^\circ - 55^\circ) \cdot \sin(90^\circ - 35^\circ) - \cos 35^\circ \cdot \cos 55^\circ$

$= \cos 55^\circ \cdot \cos 35^\circ - \cos 35^\circ \cdot \cos 55^\circ$

$= 0$

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1. মান নির্ণয় কৰা —

(vi) $\tan 35^\circ \tan 60^\circ \tan 55^\circ \tan 30^\circ$

$= \tan(90^\circ - 55^\circ) \cdot \tan(90^\circ - 30^\circ) \tan 55^\circ \times \tan 30^\circ$

$= \cot 55^\circ \times \cot 30^\circ \times \tan 55^\circ \times \tan 30^\circ$

$= \frac{1}{\tan 55^\circ} \times \frac{1}{\tan 30^\circ} \times \tan 55^\circ \times \tan 30^\circ$

$= 1$

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1. মান নির্ণয় কৰা —

(vii) $\dfrac{\cot 54^\circ}{\tan 36^\circ} + \dfrac{\tan 20^\circ}{\cot 70^\circ} - 2$

$= \dfrac{\cot(90^\circ - 36^\circ)}{\tan 36^\circ} + \dfrac{\tan(90^\circ - 70^\circ)}{\cot 70^\circ} - 2$

$= \dfrac{\tan 36^\circ}{\tan 36^\circ} + \dfrac{\cot 70^\circ}{\cot 70^\circ} - 2$

$= 1 + 1 - 2$

$= 2 - 2 = 0$

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1. মান নির্ণয় কৰা —

(viii) $3\dfrac{\sin 23^\circ}{\cos 67^\circ} + 4\dfrac{\sec 47^\circ}{\operatorname{cosec} 43^\circ}$

$$= 3\frac{\sin(90^\circ - 67^\circ)}{\cos 67^\circ} + 4\cdot\frac{\sec(90^\circ - 43^\circ)}{\operatorname{cosec} 43^\circ}$$

$$= 3 \times \frac{\cos 67^\circ}{\cos 67^\circ} + 4\cdot\frac{\operatorname{cosec} 43^\circ}{\operatorname{cosec} 43^\circ}$$

$$= 3 + 4$$

$$= 7$$

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$\tan(90^\circ - A) = \cot A$

1. মান নির্ণয় কৰা —

(ix) $\tan 5^\circ \tan 25^\circ \tan 30^\circ \tan 65^\circ \tan 85^\circ$

$= \tan(90^\circ - 85^\circ) \cdot \tan(90^\circ - 65^\circ) \cdot \tan 30^\circ \cdot \tan 65^\circ \cdot \tan 85^\circ$

$= \cot 85^\circ \cdot \cot 65^\circ \cdot \tan 30^\circ \cdot \tan 65^\circ \cdot \tan 85^\circ$

$= \frac{1}{\tan 85^\circ} \cdot \frac{1}{\tan 65^\circ} \cdot \tan 30^\circ \cdot \tan 65^\circ \cdot \tan 85^\circ$

$= \tan 30^\circ = \frac{1}{\sqrt{3}}$

মূল্যায়ন



1 | tan 48°ৰ মান

A tan 42°

B cot 42°

C tan 16°

D cot 16° 0

$\tan(90° - A)$

$= \cot A$

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মূল্যায়ন



2 | $\frac{\cot 54^0}{\tan 36^0} =$

A 0

B 1

C $\frac{4}{3}$

D $\frac{3}{4}$

$\frac{\cot(90^\circ - 36^\circ)}{\tan 36^\circ}$

$= \frac{\tan 36^\circ}{\tan 36^\circ}$

$= 1$