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आज क्या पढेंगे ?

1 कुछ विशिष्ट कोणों के त्रिकोणमितीय अनुपात

↳ 0°/30°/45°/60°/90°

Q. $\frac{\sin 90^\circ + \cos 45^\circ - 2 \times \tan 45^\circ}{\sec 30^\circ + \operatorname{cosec} 30^\circ}$

$= \frac{1 + \frac{1}{\sqrt{2}} - 2 \times 1}{\frac{2}{\sqrt{3}} + 2}$


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$\sqrt{\frac{0}{4}}=\sqrt{0}$
$\sqrt{\frac{1}{4}}=\frac{1}{2}$
$\sqrt{\frac{2}{4}}=\frac{1}{\sqrt{2}}$
$\sqrt{\frac{3}{4}}$
$\sqrt{\frac{4}{4}}$
0°
30°
45°
60°
90°
Sinθ
0
$\frac{1}{2}$
$\frac{1}{\sqrt{2}}$
$\frac{\sqrt{3}}{2}$
1
Cosθ
1
$\frac{\sqrt{3}}{2}$
$\frac{1}{\sqrt{2}}$
$\frac{1}{2}$
0
tanθ
0
$\frac{1}{\sqrt{3}}$
1
$\sqrt{3}$
अपरिभाषित
Cotθ
अपरिभाषित
$\sqrt{3}$
1
$\frac{1}{\sqrt{3}}$
0
Secθ
1
$\frac{2}{\sqrt{3}}$
$\sqrt{2}$
2
अपरिभाषित
Cosecθ
अपरिभाषित
2
$\sqrt{2}$
$\frac{2}{\sqrt{3}}$
1
$\frac{\sin\theta}{\cos\theta}$
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$\sin 45^\circ = \frac{1}{\sqrt{2}} = \cos 45^\circ$

$\tan 45^\circ = 1 = \cot 45^\circ$

$\tan 0^\circ = 0$

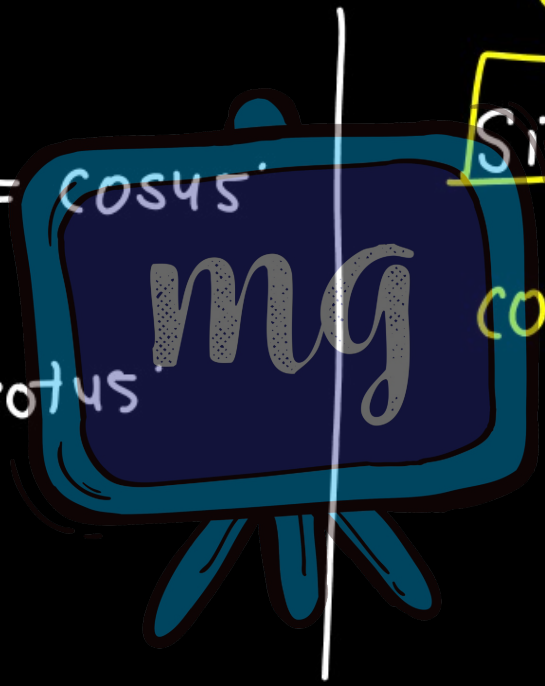
$\sin 0^\circ = 0$

$\cos 0^\circ = 1$

$\tan 90^\circ = \infty$

$\sin 90^\circ = 1$

$\cos 90^\circ = 0$

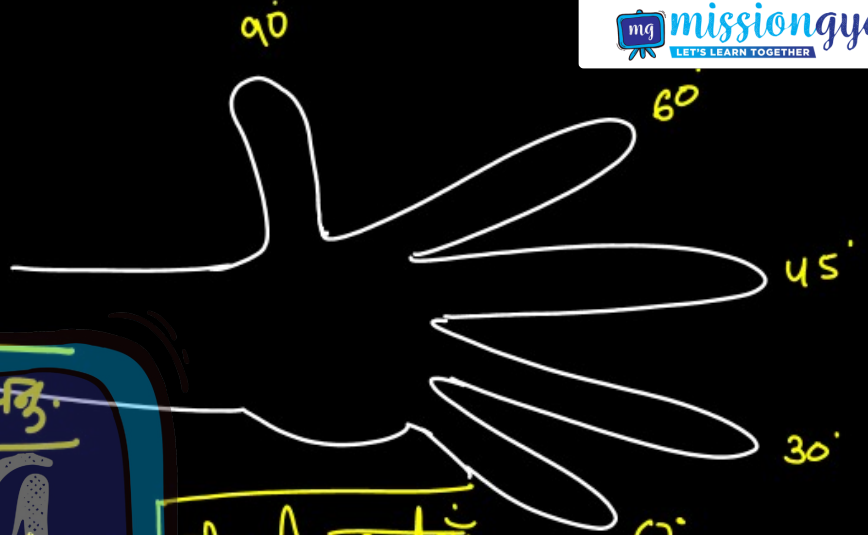


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$\cos 90^\circ = \frac{\sqrt{0}}{2} = \frac{0}{2}$

$\cos 90^\circ = 0$



$\cos 30^\circ = \frac{\sqrt{3}}{2}$

$\tan\theta = \frac{\sqrt{\text{नीचली अगु.}}}{\sqrt{\text{ऊपरी अगु.}}}$

$\sin\theta = \frac{\sqrt{\text{नीचली अगुलीयाँ}}}{2}$

$\tan 60^\circ = \frac{\sqrt{3}}{\sqrt{1}}$

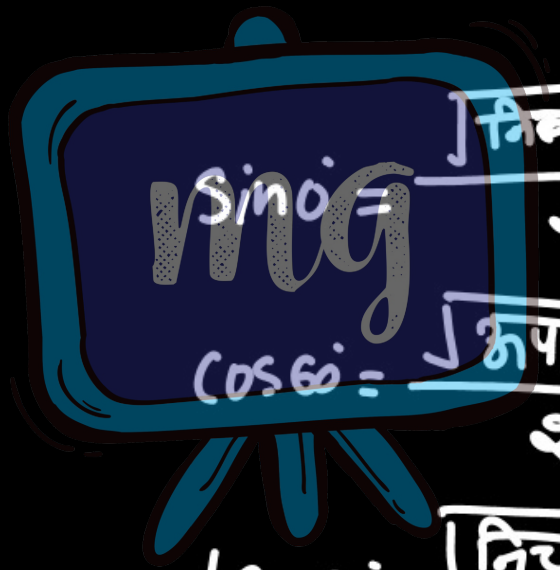
$\sin 60^\circ = \frac{\sqrt{3}}{2}$

$\tan 60^\circ = \sqrt{3}$

$\cos\theta = \frac{\sqrt{\text{ऊपरी अगुलीयाँ}}}{2}$

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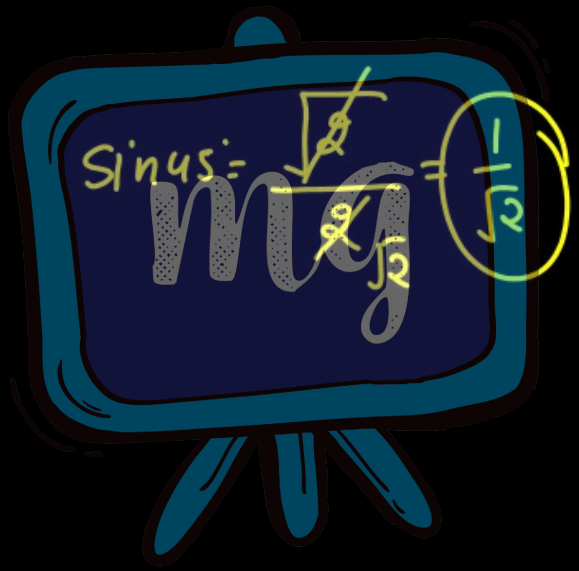
$$\sin 0^\circ = \frac{\text{सामने}}{\text{कर्ण}} = \frac{0}{2} = 0$$

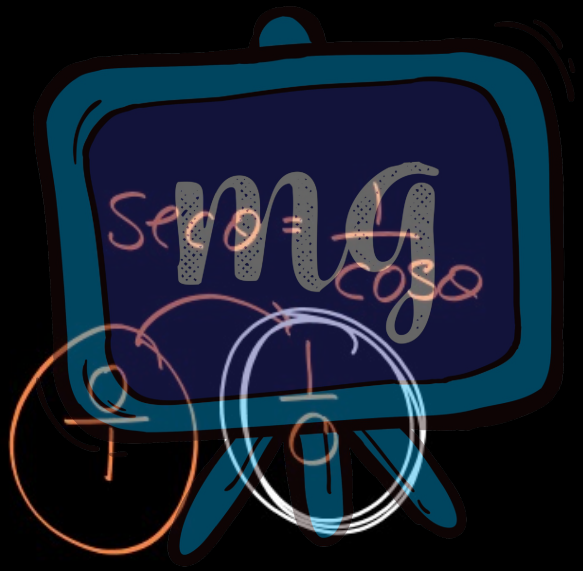
$$\cos 60^\circ = \frac{\text{आधार}}{\text{कर्ण}} = \frac{1}{2} = \frac{1}{2}$$

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

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प्रश्नावली 8.2

$\text{Cosec}60° = \frac{2}{\sqrt{3}}$

$\text{Sec}30° = \frac{2}{\sqrt{3}}$

$\sin 60° = \frac{\sqrt{3}}{2}$

$\cos 30° = \frac{\sqrt{3}}{2}$

$\sin 30° = \frac{1}{2}$

$\cos 60° = \frac{1}{2}$

Q.1 निम्नलिखित के मान ज्ञात कीजिए

(i) $\sin 60° \cos 30° + \sin 30° \cos 60°$

हल :-

$$\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times \frac{1}{2}$$

$$\frac{3}{4} + \frac{1}{4}$$

$$\frac{3+1}{4} = \frac{4}{4} = 1$$

प्रश्नावली 8.2

(ii) $2\tan^2 45° + \cos^2 30° - \sin^2 60°$



हल

$= 2(1)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 - \left(\frac{\sqrt{3}}{2}\right)^2$

$= 2 \times 1$

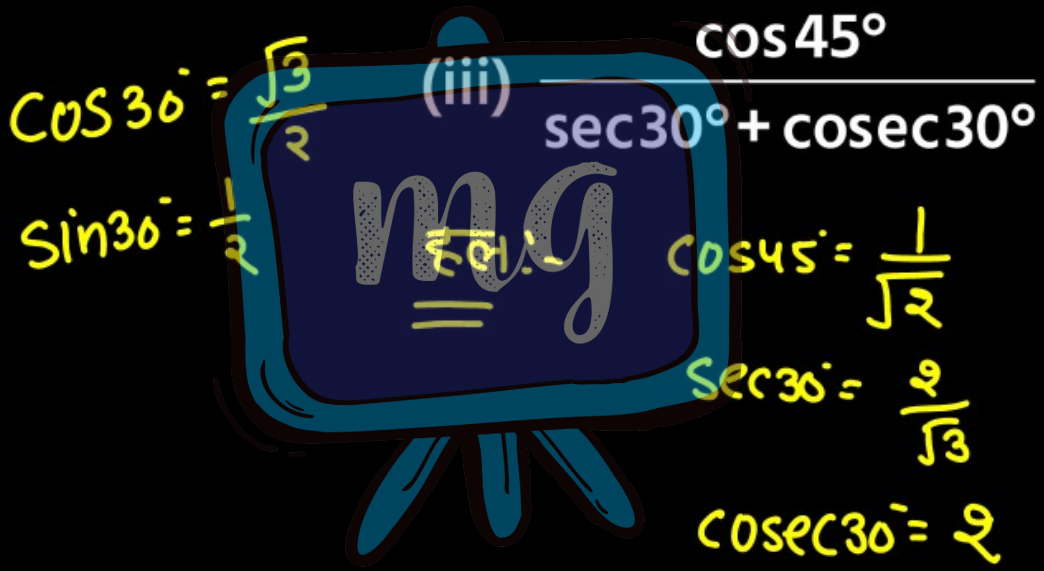
$= 2$

$\tan 45° = 1$

$\cos 30° = \frac{\sqrt{3}}{2}$

$\sin 60° = \frac{\sqrt{3}}{2}$

प्रश्नावली 8.2


(iii) $\frac{\cos 45°}{\sec 30° + \operatorname{cosec} 30°}$
हल :-
$\cos 30° = \frac{\sqrt{3}}{2}$
$\sin 30° = \frac{1}{2}$
$\cos 45° = \frac{1}{\sqrt{2}}$
$\sec 30° = \frac{2}{\sqrt{3}}$
$\operatorname{cosec} 30° = 2$

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$$\left(\frac{\frac{a}{b}}{\frac{c}{d}}\right) = \frac{a \times d}{b \times c}$$

$$= \frac{1}{\sqrt{2}}$$

$$\frac{\frac{2}{\sqrt{3}} + \frac{2}{1}}{\frac{1}{\sqrt{2}}}$$

$$= \frac{1 \times \sqrt{3}}{\sqrt{2}(2+2\sqrt{3})}$$

$$\frac{2+2\sqrt{3}}{\sqrt{3}}$$



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$$= \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} \times \frac{(1-\sqrt{3})}{(1^2-(\sqrt{3})^2)}$$

$$= \frac{\sqrt{6}}{4} \frac{(1-\sqrt{3})}{(1-3)}$$

$$= \frac{\sqrt{6}}{4} \frac{(1-\sqrt{3})}{-2}$$

$$= \frac{-\sqrt{6}(1-\sqrt{3})}{8} = \frac{-\sqrt{6}+\sqrt{18}}{8}$$

$$= \frac{\sqrt{3}}{2 \cdot \sqrt{2} \cdot (1+\sqrt{3})}$$

$$= \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{1+\sqrt{3}}$$

परिमेयकरण

$$= \frac{\sqrt{3}}{2} \times \frac{1 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} \times \frac{1 \times (1-\sqrt{3})}{(1+\sqrt{3})(1-\sqrt{3})}$$

$(a+b)\ (a-b)$

$= a^2-b^2$

प्रश्नावली 8.2

(iv) $\dfrac{\sin 30° + \tan 45° - \operatorname{cosec} 60°}{\sec 30° + \cos 60° + \cot 45°}$

प्रश्नावली 8.2

(v) $\dfrac{5\cos^2 60° + 4\sec^2 30° - \tan^2 45°}{\sin^2 30° + \cos^2 30°}$

प्रश्नावली 8.2

Q.2 सही विकल्प चुनिए और अपने विकल्प का औचित्य दीजिए :

(i) $\frac{2\tan 30°}{1+\tan^2 30°} =$

(अ) $\sin 60°$ (ब) $\cos 60°$

(स) $\tan 60°$ (द) $\sin 30°$

प्रश्नावली 8.2

(ii) $\dfrac{1-\tan^2 45°}{1+\tan^2 45°} =$

(अ) $\tan 90°$ (ब) 1

(स) $\sin 45°$ (द) 0

प्रश्नावली 8.2

(iii) $\sin 2A = 2\sin A$ तब सत्य होता है, जबकि A बराबर है :

(अ) $0°$ (ब) $30°$

(स) $45°$ (द) $60°$

प्रश्नावली 8.2

(iv) $\frac{2\tan 30°}{1-\tan^2 30°}$ = बराबर है:

(अ) $\cos 60°$ (ब) $\sin 60°$

(स) $\tan 60°$ (द) $\sin 30°$


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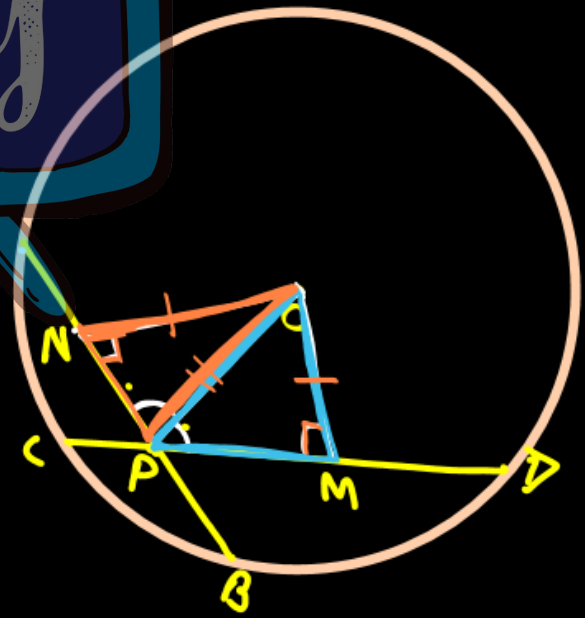
AB=CD

जीवाएँ AB और CD, P पर प्रतिच्छेद करती हैं।

सिद्ध करना:-

∠OPA=∠OPD

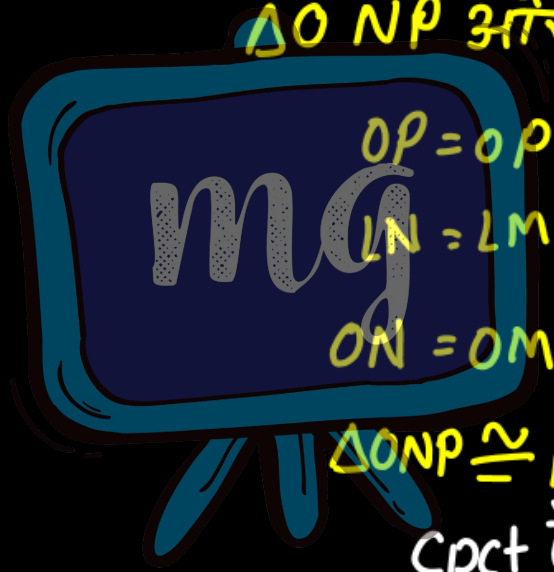
रचना:- OM⊥CD, ON⊥AB की रचना की।



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उपपत्ति:-



$\triangle ONP$ और $\triangle OMP$ में

$OP = OP$ (उभयनिष्ठ भुजा)

$\angle N = \angle M$ (90°)

$ON = OM$

$\triangle ONP \cong \triangle OMP$ [RHS सर्वांगसमता]

CPCT से

$\angle OPN = \angle OPM$

या

$\angle OPA = \angle OPD$