

	$\sqrt{\frac{0}{4}}$ 0°	$\sqrt{\frac{1}{4}}$ 30°	$\sqrt{\frac{2}{4^2}}$ 45°	$\sqrt{\frac{3}{4}}$ 60°	$\sqrt{\frac{4}{4}}$ 90°
Sin	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞

Ex-7.2

① (i) $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$

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

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

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

$$\frac{27 + 16 - 24\sqrt{3}}{11}$$
$$= \frac{43 - 24\sqrt{3}}{11}$$

(iv) $\frac{\sin 30^\circ + \tan 45^\circ - \csc 60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$

$$= \frac{\frac{1}{2} + 1 - \frac{2}{\sqrt{3}}}{\frac{2}{\sqrt{3}} + \frac{1}{2} + 1} = \frac{\sqrt{3} + 2\sqrt{3} - 4}{2\sqrt{3}}$$

$$\frac{4 + \sqrt{3} + 2\sqrt{3}}{2\sqrt{3}}$$

$$= \frac{3\sqrt{3} - 4}{3\sqrt{3} + 4} \times \frac{3\sqrt{3} - 4}{3\sqrt{3} - 4}$$

$$= \frac{(3\sqrt{3} - 4)^2}{(3\sqrt{3})^2 - 4^2} = \frac{(3\sqrt{3})^2 + 4^2 - 24\sqrt{3}}{27 - 16}$$

2 (i)

$$\frac{2 \tan 30}{1 + \tan^2 30}$$

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

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

$$= \frac{\frac{2}{\sqrt{3}}}{\frac{4}{3}} = \frac{3 \times 2}{4 \sqrt{3}}$$

$$= \frac{3}{2 \sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{3 \sqrt{3}}{2 \times 3} = \frac{\sqrt{3}}{2} \text{ Ans}$$

③

$$\tan(A+B) = \sqrt{3}$$

$$\tan(A+B) = \tan 60$$

$$\text{So } A+B = 60 \text{ --- (i)}$$

$$\tan(A-B) = \frac{1}{\sqrt{3}}$$

$$\tan(A-B) = \tan 30$$

$$A-B = 30 \text{ --- (ii)}$$

$$A+B = 60$$

$$A-B = 30$$

$$\text{Add } 2A = 90$$

$$A = \frac{90}{2}$$

$$\boxed{A = 45}$$

$$45 + B = 60$$

$$\boxed{B = 15}$$

T-Values of Complementary Angle-

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

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

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

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

$$\sec(90^\circ - \theta) = \csc \theta$$

$$\csc(90^\circ - \theta) = \sec \theta$$

$$\sin \longleftrightarrow \cos$$

$$\tan \longleftrightarrow \cot$$

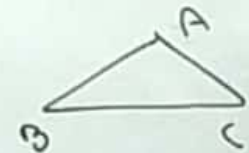
$$\sec \longleftrightarrow \csc$$

$$\begin{aligned}
 \text{(i)} \quad & \frac{\sin 18}{\cos 72} \\
 &= \frac{\sin 18}{\cos (90-18)} \\
 &= \frac{\sin 18}{\sin 18} \\
 &= 1
 \end{aligned}$$

Ex-8.3

$$\begin{aligned}
 2 \quad & \text{(i)} \quad \tan 48 \tan 23 \tan 42 \tan 67 \\
 &= \tan (90-42) \tan (90-67) \tan 42 \tan 67 \\
 &= \cot 42 \cot 67 \times \tan 42 \tan 67 \\
 &= \frac{1}{\tan 42} \times \frac{1}{\tan 67} \times \tan 42 \times \tan 67 \\
 &= 1
 \end{aligned}$$

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$$\begin{aligned} A + B + C &= 180 \\ B + C &= 180 - A \end{aligned}$$

③

$$\tan 2A = \cot(A - 18)$$



$$(\cot(90 - 0) = \tan 0)$$

$$\cot(90 - 2A) = \cot(A - 18)$$

$$90 - 2A = A - 18$$

$$108 = 3A$$

$$\boxed{A = 36^\circ}$$

$$\begin{aligned} \sin\left(\frac{B+C}{2}\right) &= \sin\left(\frac{180-A}{2}\right) \\ &= \sin\left(\frac{180}{2} - \frac{A}{2}\right) \\ &= \sin\left(90 - \frac{A}{2}\right) \\ &= \cos \frac{A}{2} \end{aligned}$$