



Question 11:

$$\begin{aligned} \text{(i) L.H.S.} &= \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ \\ &= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} - \frac{1}{2} \times \frac{1}{2} \Rightarrow \frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \frac{1}{2} \end{aligned}$$

$$\text{R.H.S.} = \sin 30^\circ = \frac{1}{2}$$

R.H.S. = L.H.S.

Hence,  $\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ = \sin 30^\circ$

$$\begin{aligned} \text{(ii) L.H.S.} &= \cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ \\ &= \frac{1}{2} \times \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} \times \frac{1}{2} = \frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4} = \frac{\sqrt{3}}{2} \end{aligned}$$

$$\text{R.H.S.} = \cos 30^\circ = \frac{\sqrt{3}}{2}$$

$\therefore$  L.H.S. = R.H.S.

Hence,  $\cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ = \cos 30^\circ$

$$\text{(iii) LHS} = 2 \sin 30^\circ \cos 30^\circ \Rightarrow 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

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

R.H.S. = L.H.S.

Hence,  $2 \sin 30^\circ \cos 30^\circ = \sin 60^\circ$

$$\text{(iv) LHS} = 2 \sin 45^\circ \cos 45^\circ = 2 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = 1$$

$$\text{R.H.S.} = \sin 90^\circ = 1$$

R.H.S. = L.H.S.

Hence,  $2 \sin 45^\circ \cos 45^\circ = \sin 90^\circ$

Question 12:

$$A = 45^\circ \Rightarrow 2A = 90^\circ$$

$$(i) \sin 2A = \sin 90^\circ = 1$$

$$\therefore 2 \sin A \cos A = 2 \sin 45^\circ \cos 45^\circ = 2 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = 1$$

$$\therefore \sin 2A = 2 \sin A \cos A$$

$$(ii) \cos 2A = \cos 90^\circ = 0$$

$$2 \cos^2 A - 1 = 2 \cos^2 45^\circ - 1$$

$$= 2 \left( \frac{1}{\sqrt{2}} \right)^2 - 1 = 1 - 1 = 0$$

$$1 - 2 \sin^2 A = 1 - 2 \sin^2 45^\circ = 1 - 2 \times \left( \frac{1}{\sqrt{2}} \right)^2 = 1 - 1 = 0$$

$$\therefore \cos 2A = 2 \cos^2 A - 1 = 1 - 2 \sin^2 A$$

\*\*\*\*\* END \*\*\*\*\*