Trigonometric Ratios Ex 5.2 Q1

Answer :

We have,

$\sin 45°\sin 30°+\cos 45°\cos 30°$ ..... (1)

Now $\sin 45° = \cos 45° = \frac{1}{\sqrt{2}}$, $\sin 30° = \frac{1}{2}$, $\cos 30° = \frac{\sqrt{3}}{2}$

So by substituting above values in equation (1)

We get,

$$\sin 45°\sin 30°+\cos 45°\cos 30°$$

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

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

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

Therefore,

$$\sin 45°\sin 30°+\cos 45°\cos 30° = \frac{1+\sqrt{3}}{2\sqrt{2}}$$

Trigonometric Ratios Ex 5.2 Q2

Answer :

We have to find the value of the expression

$\sin 60°\cos 30° + \cos 60°\sin 30°$ ..... (1)

Now $\sin 60^\circ = \cos 30^\circ = \frac{\sqrt{3}}{2}, \sin 30^\circ = \cos 60^\circ = \frac{1}{2}$

So by substituting above values in equation (1)

We get,

$$\sin 60^\circ \cos 30^\circ + \cos 60^\circ \sin 30^\circ$$
$$= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times \frac{1}{2}$$
$$= \frac{3}{4} + \frac{1}{4}$$
$$= \frac{3+1}{4}$$
$$= \frac{4}{4}$$
$$= 1$$

Therefore,

$$\sin 60^\circ \cos 30^\circ + \cos 60^\circ \sin 30^\circ = 1$$

Trigonometric Ratios Ex 5.2 Q3

Answer :

We have to find the value of the following expression

$\cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ$ ..... (1)

Now $\sin 45^\circ = \cos 45^\circ = \frac{1}{\sqrt{2}}, \sin 60^\circ = \frac{\sqrt{3}}{2}, \cos 60^\circ = \frac{1}{2}$

So by substituting above values in equation (1)

We get,

$$\cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ$$
$$= \frac{1}{2} \times \frac{1}{\sqrt{2}} - \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{2}}$$
$$= \frac{1}{2\sqrt{2}} - \frac{\sqrt{3}}{2\sqrt{2}}$$
$$= \frac{1-\sqrt{3}}{2\sqrt{2}}$$

Therefore,

$$\cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ = \frac{1-\sqrt{3}}{2\sqrt{2}}$$

********** END **********