Trigonometric Ratios Ex 5.2 Q20

Answer :

We have,

$$2\sin 3x = \sqrt{3}$$

$$\Rightarrow \sin 3x = \frac{\sqrt{3}}{2}$$

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

Therefore,

$$\sin 3x = \frac{\sqrt{3}}{2}$$

$$\Rightarrow 3x = 60^\circ$$

$$\Rightarrow x = \frac{60^\circ}{3}$$

$\Rightarrow x = 20^\circ$

Therefore,

$x = 20^\circ$

Trigonometric Ratios Ex 5.2 Q21

Answer :

We have,

$$2\sin\frac{x}{2}=1$$

$$\Rightarrow \sin\frac{x}{2}=\frac{1}{2}$$

Since, $\sin 30^\circ=\frac{1}{2}$

Therefore,

$$\sin\frac{x}{2}=\frac{1}{2}$$

$$\Rightarrow \frac{x}{2}=30^\circ$$

$$\Rightarrow x=2\times 30^\circ$$

$$\Rightarrow x=60^\circ$$

Therefore,

$$x=60^\circ$$

Answer :

We have,

$\sqrt{3}\sin x = \cos x$

Now by cross multiplying we get,

$\sqrt{3}\sin x = \cos x$

$\Rightarrow \frac{\sin x}{\cos x} = \frac{1}{\sqrt{3}}$ ..... (1)

Now we know that

$\frac{\sin x}{\cos x} = \tan x$ ..... (2)

Therefore from equation (1) and (2)

We get,

$\tan x = \frac{1}{\sqrt{3}}$ ..... (3)

Since,

$\tan 30^\circ = \frac{1}{\sqrt{3}}$ ..... (4)

Therefore, by comparing equation (3) and (4) we get,

$x = 30^\circ$

Therefore,

$x = 30^\circ$

Trigonometric Ratios Ex 5.2 Q23

Answer :

We have,

$\tan x = \sin 45^\circ \cos 45^\circ + \sin 30^\circ$ ..... (1)

Now we know that

$\sin 45^\circ = \cos 45^\circ = \frac{1}{\sqrt{2}}$ and $\sin 30^\circ = \frac{1}{2}$

Now by substituting above values in equation (1), we get,

$\tan x = \sin 45^\circ \cos 45^\circ + \sin 30^\circ$

$\tan x = \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} + \frac{1}{2}$

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

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

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

$= \frac{2}{2}$

$= 1$

Therefore,

$\tan x = 1$ ..... (2)

Since,

$\tan 45^\circ = 1$ ..... (3)

Therefore by comparing equation (2) and (3)

We get,

$x = 45^\circ$

Therefore,

$x = 45^\circ$

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