

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

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

Therefore from equation (1) and (2)

We get,

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

Since,

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

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,

$$\tan x = \sin 45^{\circ} \cos 45^{\circ} + \sin 30^{\circ} \dots (1)$$

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 \*\*\*\*\*\*\*