Trigonometric Ratios Ex 5.2 Q37

Answer :

Given:

$\sin(A+2B)=\frac{\sqrt{3}}{2}$ ...... (1)

$\cos(A+4B)=0$ ...... (2)

We know that,

$\sin 60°=\frac{\sqrt{3}}{2}$ ...... (3)

$\cos 90°=0$ ...... (4)

Now by comparing equation (1) and (3)

We get,

$A+2B=60$ ...... (5)

Now by comparing equation (2) and (4)

We get,

$A+4B=90$ ...... (6)

Now to get the values of *A* and *B*, let us solve equation (5) and (6) simultaneously

Therefore by subtracting equation (5) from (6)

We get,

$$\begin{array}{r} A+4B=90 \\ -A+2B=60 \\ \underline{(-)\ (-)\quad (-)} \\ 0+2B=30 \end{array}$$

Therefore,

$$2B=30$$

$$\Rightarrow\ B=\frac{30}{2}$$

$$\Rightarrow\ B=15°$$

Hence $B=15°$

Now by multiplying equation (5) by 2

We get,

$2A+2\times 2B=2\times 60$

$2A+4B=120$ ...... (7)

Now by subtracting equation (6) from (7)

We get,

$$\begin{array}{r} 2A+4B=120 \\ -A+4B=\ 90 \\ \underline{(-)\ (-)\quad (-)} \\ A+0=\ 30 \end{array}$$

Therefore,

$A=30$

Hence $\boxed{A=30°}$

Therefore the values of *A* and *B* are as follows $A=30°$ and $B=15°$

Trigonometric Ratios Ex 5.2 Q38

Answer :

Given:

$\tan A = \frac{1}{2}$ ...... (1)

$\tan B = \frac{1}{3}$ ...... (2)

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

Now by substituting the value of $\tan A$ and $\tan B$ from equation (1) and (2) in equation (3)

We get,

$$\tan(A+B) = \frac{\left(\frac{1}{2}\right)+\left(\frac{1}{3}\right)}{1-\left(\frac{1}{2}\right)\times\left(\frac{1}{3}\right)}$$

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

$$= \frac{\left(\frac{1}{2}\right)+\left(\frac{1}{3}\right)}{1-\left(\frac{1}{6}\right)}$$

$$= \frac{\frac{5}{6}}{\frac{5}{6}}$$

$$= \frac{5}{6}\times\frac{6}{5}$$

$$= 1$$

Therefore,

$\tan(A+B) = 1$ ...... (3)

Now we know that

$\tan 45° = 1$ ...... (4)

Now by comparing equation (3) and (4)

We get,

$$\boxed{A + B = 45°}$$

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