

## Trigonometric Ratios Ex 5.2 Q27

## Answer:

(i) Given:

$$A = B = 60^{\circ}$$
 ..... (1)

To verify:

$$\cos(A - B) = \cos A \cos B + \sin A \sin B \dots (2)$$

Now consider left hand side of the expression to be verified in equation (2) Therefore,

$$\cos(A-B) = \cos(60-60)$$
$$= \cos 0$$
$$= 1$$

Now consider right hand side of the expression to be verified in equation (2) Therefore.

 $\cos A \cos B + \sin A \sin B = \cos B \cos B + \sin B \sin B$ 

$$= \cos^2 B + \sin^2 B$$
$$= 1$$

Hence it is verified that,

$$cos(A - B) = cos A cos B + sin A sin B$$

(ii) Given:

$$A = B = 60^{\circ}$$
 ..... (1)

To verify:

$$\sin(A-B) = \sin A \cos B - \cos A \sin B \dots (2)$$

Now consider LHS of the expression to be verified in equation (2)

Therefore,

$$\sin(A-B) = \sin(B-B)$$

$$= \sin 0$$

$$= 0$$

Now by substituting the value of A and B from equation (1) in the above expression. We get

 $\sin A \cos B - \cos A \sin B = \sin B \cos B - \cos B \sin B$ 

$$=0$$

Hence it is verified that,

$$\sin(A-B) = \sin A \cos B - \cos A \sin B$$

(iii) Given:

$$A = B = 60^{\circ}$$
 ..... (1)

To verify:

$$\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \tan B} \dots (2)$$

Now consider LHS of the expression to be verified in equation (2)

Therefore,

$$\tan(A-B) = \tan(B-B)$$

$$= \tan 0$$

$$= 0$$

Now consider RHS of the expression to be verified in equation (2)

Therefore,

Now by substituting the value of A and B from equation (1) in the above expression

We get,

$$\frac{\tan A - \tan B}{1 + \tan A \tan B} = \frac{\tan B - \tan B}{1 + \tan B \tan B}$$

$$= \frac{0}{1 + \tan^2 B}$$

$$= 0$$

Hence it is verified that,

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

Trigonometric Ratios Ex 5.2 Q28

## Answer:

(i) Given

$$A = 30^{\circ} \text{ and } B = 60^{\circ} \dots (1)$$

To verify:

$$\sin(A+B) = \sin A \cos B + \cos A \sin B \dots (2)$$

Now consider LHS of the expression to be verified in equation (2) Therefore,

$$\sin(A+B) = \sin(30+60)$$
$$= \sin 90$$
$$= 1$$

Now consider RHS of the expression to be verified in equation (2) Therefore;

 $\sin A \cos B + \cos A \sin B = \sin 30 \cos 60 + \cos 30 \sin 60$ 

$$= \frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{3}$$
$$= \frac{1+3}{4}$$

Hence it is verified that,

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$

(ii) Given:

$$A = 30^{\circ} \text{ and } B = 60^{\circ} \dots (1)$$

To verify:

$$\cos(A+B) = \cos A \cos B - \sin A \sin B \dots (2)$$

Now consider LHS of the expression to be verified in equation (2) Therefore,

$$\cos(30+60) = \cos 90$$
$$= 0$$

Now consider RHS of the expression to be verified in equation (2) Therefore,

 $\cos A \cos B - \sin A \sin B = \cos 30 \cos 60 - \sin 30 \sin 60$ 

$$= \frac{\sqrt{3}}{2} \times \frac{1}{2} - \frac{1}{2} \times \frac{\sqrt{3}}{2}$$
$$= 0$$

Hence it is verified that,

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

