

Transformation Formulae Ex 8.2 Q4(i)

We have

LHS = 
$$\cos\left(\frac{3\pi}{4} + x\right) - \cos\left(\frac{3\pi}{4} - x\right)$$
  
=  $-\left[\cos\left(\frac{3\pi}{4} - x\right) - \cos\left(\frac{3\pi}{4} + x\right)\right]$   
=  $-\left[2\sin\frac{3\pi}{4}\sin x\right]$  [:  $\cos(A - B) - \cos(A + B) = 2\sin A\sin B$ ]  
=  $-2\sin\frac{\pi}{4}\sin x$   
=  $-2\sin\left(\frac{\pi}{2} + \frac{\pi}{4}\right)\sin x$   
=  $-2\cos\frac{\pi}{4}\sin x$   
=  $-2\cos\frac{\pi}{4}\sin x$   
=  $-2\frac{\sqrt{2}}{\sqrt{2}}\sin x$   
=  $-\sqrt{2}\sin x$   
= RHS

 $\therefore \cos\left(\frac{3\pi}{4} + x\right) - \cos\left(\frac{3\pi}{4} - x\right) = -\sqrt{2}\sin x \quad \text{Hence proved.}$ 

Transformation Formulae Ex 8.2 Q4(ii)

We have

LHS = 
$$\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right)$$
  
=  $2\cos\frac{\pi}{4}\cos x$  [ $\because \cos\left(A + B\right) + \cos\left(A - B\right) = 2\cos A\cos B$ ]  
=  $2\times\frac{1}{\sqrt{2}}\times\cos x$   
=  $\frac{\sqrt{2}\times\sqrt{2}}{\sqrt{2}}\cos x$   
=  $\sqrt{2}\cos x$   
= RHS

$$\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) = \sqrt{2}\cos x.$$

Transformation Formulae Ex 8.2 Q5(i)

We have,

LHS = 
$$sin 65^{\circ} + cos 65^{\circ}$$
  
=  $sin (45^{\circ} + 20^{\circ}) + cos (90^{\circ} - 25^{\circ})$   
=  $sin (45^{\circ} + 20^{\circ}) + sin 25^{\circ}$   
=  $sin (45^{\circ} + 20^{\circ}) + sin (45^{\circ} - 20^{\circ})$   
=  $2 sin 45^{\circ} cos 20^{\circ}$   
=  $2 \times \frac{1}{\sqrt{2}} cos 20^{\circ}$   
=  $\sqrt{2} \times \sqrt{2} \times cos 20^{\circ}$   
=  $\sqrt{2} cos 20^{\circ}$   
= RHS

∴  $sin 65^{\circ} + cos 65^{\circ} = \sqrt{2} cos 20^{\circ}$  Hence proved.

Transformation Formulae Ex 8.2 Q5(ii)

We have,

LHS = 
$$\sin 47^{\circ} + \cos 77^{\circ}$$
  
=  $\sin (90^{\circ} - 43^{\circ}) + \cos 77^{\circ}$   
=  $\cos 43^{\circ} + \cos 77^{\circ}$   
=  $\cos (60^{\circ} - 17^{\circ}) + \cos (60^{\circ} + 17^{\circ})$   
=  $2 \cos 60^{\circ} \cos 17^{\circ}$   
=  $2 \times \frac{1}{2} \times \cos 17^{\circ}$   
=  $\cos 17^{\circ}$   
= RHS

 $\therefore$  sin 47° + cos 77° = cos 17° Hence proved.

\*\*\*\*\*\*\* END \*\*\*\*\*\*\*