

Trigonometric Functions Ex 5.2 Q 4 We have,

$$sin\theta + cos\theta = 0$$

$$\Rightarrow$$
  $\sin \theta = -\cos \theta - - - - - - (i)$ 

$$\Rightarrow \frac{\sin \theta}{\cos \theta} = -1$$

$$\Rightarrow$$
 tan $\theta = -1$ 

We know that,

$$\sec^2 \theta - \tan^2 \theta = 1$$

$$\Rightarrow$$
  $\sec^2\theta = 1 + \tan^2\theta$ 

$$\Rightarrow$$
  $\sec \theta = \pm \sqrt{1 + \tan^2 \theta}$ 

In the  $4^{th}$  quadrant  $\sec \theta$  is positive.

$$sec \theta = \sqrt{1 + \tan^2 \theta}$$

$$= \sqrt{1 + (-1)^2}$$

$$= \sqrt{1 + 1}$$

$$= \sqrt{2}$$

$$\cos \theta = \frac{1}{\sec \theta} = \frac{1}{\sqrt{2}}$$

putting  $\cos \theta = \frac{1}{\sqrt{2}}$  in equation (i), we get,  $\sin \theta = -\left(\frac{1}{2}\right) = -\frac{1}{2}$ 

$$\sin\theta = -\left(\frac{1}{\sqrt{2}}\right) = -\frac{1}{\sqrt{2}}$$

Hence,  $\sin \theta = -\frac{1}{\sqrt{2}}$  and  $\cos \theta = \frac{1}{\sqrt{2}}$ .

Chapter 5 Trigonometric Functions Ex 5.2 Q 5.

We have,

$$\cos \theta = -\frac{3}{5}$$
, and  $\pi < \theta < \frac{3\pi}{2}$ 

 $\Rightarrow$   $\theta$  lies in the 3<sup>rd</sup> quadrant

We know that,

$$\Rightarrow \sin\theta = \pm \sqrt{1 - \cos^2\theta}$$

In the  $3^{rd}$  quadrant  $\sin\theta$  is negative and  $\tan\theta$  is positive.

$$\sin \theta = -\sqrt{1 - \cos^2 \theta}$$

$$= -\sqrt{1 - \left(-\frac{3}{5}\right)^2} \qquad \left[ \therefore \qquad \cos \theta = -\frac{3}{5} \right]$$

$$= -\sqrt{1 - \frac{9}{25}}$$

$$= -\sqrt{\frac{16}{25}}$$

$$= -\frac{4}{5}$$

$$\Rightarrow \qquad \sin\theta = -\frac{4}{5}$$

and, 
$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\frac{-4}{5}}{\frac{-3}{5}} = \frac{4}{5}$$

Now, 
$$\cos \theta c\theta = \frac{1}{\sin \theta} = \frac{1}{\frac{-4}{5}} = \frac{-5}{4}$$

$$\sec \theta = \frac{1}{\cos \theta} = \frac{1}{\frac{-3}{5}} = \frac{-5}{3}$$

and, 
$$\cot \theta = \frac{1}{\tan \theta} = \frac{1}{\frac{4}{3}} = \frac{3}{4}$$

$$\frac{\cos ec\theta + \cot \theta}{\sec \theta - \tan \theta} = \frac{\frac{-5}{4} + \frac{3}{4}}{\frac{-5}{3} - \frac{4}{3}}$$

$$= \frac{\frac{2}{4} \times \frac{3}{9}}{\frac{-9}{3}}$$

$$= \frac{2}{4} \times \frac{3}{9}$$

$$=\frac{1}{6}$$

$$\frac{\cos \theta + \cot \theta}{\sec \theta - \tan \theta} = \frac{1}{6}$$