

Trigonometric Identities Ex 6.1 Q81 **Answer**:

## Given:

$$\csc\theta + \cot\theta = m$$
,  
 $\csc\theta - \cot\theta = n$   
We have to prove  $mn = 1$   
We know that,  $\sin^2\theta + \cos^2\theta = 1$ 

Multiplying the two equations, we have  $(\csc\theta + \cot\theta)(\csc\theta - \cot\theta) = mn$   $\Rightarrow \left(\frac{1}{\sin\theta} + \frac{\cos\theta}{\sin\theta}\right) \left(\frac{1}{\sin\theta} - \frac{\cos\theta}{\sin\theta}\right) = mn$   $\Rightarrow \left(\frac{1 + \cos\theta}{\sin\theta}\right) \left(\frac{1 - \cos\theta}{\sin\theta}\right) = mn$   $\Rightarrow \frac{(1 + \cos\theta)(1 - \cos\theta)}{\sin^2\theta} = mn$   $\Rightarrow \frac{1 - \cos^2\theta}{\sin^2\theta} = mn$   $\Rightarrow \frac{\sin^2\theta}{\sin^2\theta} = mn$   $\Rightarrow \frac{1 - \cos^2\theta}{\sin^2\theta} = mn$   $\Rightarrow \frac{\sin^2\theta}{\sin^2\theta} = mn$   $\Rightarrow \frac{1 - \cos\theta}{\sin^2\theta} = mn$   $\Rightarrow \frac{\sin\theta}{\sin^2\theta} = mn$   $\Rightarrow \frac{\sin\theta}{\sin^2\theta} = mn$ 

Hence proved.

Trigonometric Identities Ex 6.1 Q82

## Answer:

Given:  $\cos A + \cos^2 A = 1$ We have to prove  $\sin^2 A + \sin^4 A = 1$ Now,

$$\cos A + \cos^2 A = 1$$

$$\Rightarrow$$
  $\cos A = 1 - \cos^2 A$ 

$$\Rightarrow$$
  $\cos A = \sin^2 A$ 

$$\Rightarrow \sin^2 A = \cos A$$

Therefore, we have

$$\sin^2 A + \sin^4 A = \cos A + (\cos A)^2$$
$$= \cos A + \cos^2 A$$
$$= 1$$

Hence proved.

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