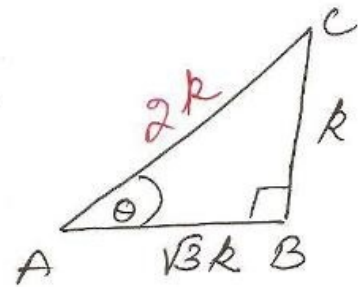


⑥ LHS

$$\begin{aligned}
 &= 1 + \frac{\cot^2 \alpha}{1 + \operatorname{cosec} \alpha} \\
 &= \frac{1 + \operatorname{cosec} \alpha + \cot^2 \alpha}{1 + \operatorname{cosec} \alpha} \\
 &= \frac{\operatorname{cosec}^2 \alpha + \operatorname{cosec} \alpha}{1 + \operatorname{cosec} \alpha} \\
 &= \frac{\operatorname{cosec} \alpha (1 + \operatorname{cosec} \alpha)}{(1 + \operatorname{cosec} \alpha)} \\
 &= \operatorname{cosec} \alpha \\
 &= \text{RHS}
 \end{aligned}$$

⑨  $\sqrt{3} \tan \theta = 1$   
 $\Rightarrow \tan \theta = \frac{1}{\sqrt{3}}$



$$\begin{aligned}
 AC &= \sqrt{3k^2 + k^2} \\
 &= \sqrt{4k^2} \\
 &= 2k
 \end{aligned}$$

$$\begin{aligned}
 \sin^2 \theta - \cos^2 \theta &= \left(\frac{k}{2k}\right)^2 - \left(\frac{\sqrt{3}k}{2k}\right)^2
 \end{aligned}$$

$$= \frac{1}{4} - \frac{3}{4}$$

$$= -\frac{2}{4}$$

$$= -\frac{1}{2}$$

⑩  $(1 + \tan^2 \theta)(1 - \sin \theta)(1 + \sin \theta)$

$$= (1 + \tan^2 \theta)(1 - \sin^2 \theta)$$

$$= \cancel{\sec^2 \theta} \cancel{\cos^2 \theta}$$

$$= 1 \quad \left[ \because \sec \theta = \frac{1}{\cos \theta} \right]$$

NCERT Exemplar Solutions by Dev Anoop (Bathinda)

⑦ LHS =  $\tan \theta + \tan(90^\circ - \theta)$

$$= \tan \theta + \cot \theta$$

$$= \frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{\sin \theta}$$

$$= \frac{\sin^2 \theta + \cos^2 \theta}{\cos \theta \sin \theta}$$

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

$$= \sec \theta \operatorname{cosec} \theta$$

$$= \sec \theta \sec(90^\circ - \theta)$$

$$= \text{RHS}$$