

MCR 3UI

$$\begin{aligned} \text{j) } LS &= (1 + \tan^2 x)(1 - \cos^2 x) & RS &= \tan^2 x \\ &= (\sec^2 x)(\sin^2 x) \\ &= \frac{1}{\cos^2 x} \cdot \sin^2 x & \because LS &= RS \\ &= \tan^2 x & \therefore & \text{QED} \end{aligned}$$

$$\text{i) } LS = \frac{\csc^2 p - \sin^2 p}{\csc^2 p (2 - \cos^2 p)} \quad RS = \cos^2 p$$

$$= \frac{\frac{1}{\sin^2 p} - \sin^2 p}{\frac{1}{\sin^2 p} (1 + 1 - \cos^2 p)}$$

$$= \frac{\frac{1}{\sin^2 p} - \sin^2 p \left(\frac{\sin^2 p}{\sin^2 p} \right)}{\frac{1}{\sin^2 p} (1 + \sin^2 p)}$$

$$= \frac{\frac{1}{\sin^2 p} - \frac{\sin^4 p}{\sin^2 p}}{\frac{1 + \sin^2 p}{\sin^2 p}}$$

$$= \frac{1 - \sin^4 p}{\sin^2 p} \div \frac{1 + \sin^2 p}{\sin^2 p}$$

$$= \frac{(1 - \sin^2 p)(1 + \sin^2 p)}{\sin^2 p} \times \frac{\sin^2 p}{1 + \sin^2 p}$$

$$= 1 - \sin^2 p$$

$$= \cos^2 p$$

$$= RS$$

$$\because LS = RS$$

$$\therefore \text{QED.}$$