

$$\begin{aligned}
 5 \text{ (v)} \quad \text{RHS} &= \frac{\sin^2 A}{1 - \cos A} \\
 &= \frac{1 - \cos^2 A}{1 - \cos A} \\
 &= \frac{(1 - \cos A)(1 + \cos A)}{(1 - \cos A)} \\
 &= 1 + \frac{1}{\sec A} \\
 &= \frac{\sec A + 1}{\sec A} \\
 &= \text{LHS}
 \end{aligned}$$

$$\begin{aligned}
 5 \text{ (v)} \quad \text{LHS} &= \frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} \\
 &\div \text{ num and den by } \sin A \\
 &= \frac{\frac{\cos A}{\sin A} - \frac{\sin A}{\sin A} + \frac{1}{\sin A}}{\frac{\cos A}{\sin A} + \frac{\sin A}{\sin A} - \frac{1}{\sin A}} \\
 &= \frac{\cot A - 1 + \operatorname{cosec} A}{\cot A + 1 - \operatorname{cosec} A} \\
 &= \frac{(\cot A + \operatorname{cosec} A) - (\operatorname{cosec}^2 A - \cot^2 A)}{\cot A + 1 - \operatorname{cosec} A} \\
 &= \frac{(\cot A + \operatorname{cosec} A) - (\operatorname{cosec} A + \cot A)}{\cot A + 1 - \operatorname{cosec} A} \\
 &= \frac{(\cot A + \operatorname{cosec} A)(1 - \operatorname{cosec} A + \cot A)}{(\cot A + 1 - \operatorname{cosec} A)} \\
 &= \operatorname{cosec} A + \cot A \\
 &= \text{RHS}
 \end{aligned}$$

$$\begin{aligned}
 5 \text{ (vi)} \quad \text{LHS} &= \sqrt{\frac{1 + \sin A}{1 - \sin A}} \\
 &= \sqrt{\frac{1 + \sin A}{1 - \sin A} \times \frac{1 + \sin A}{1 + \sin A}} \\
 &= \sqrt{\frac{(1 + \sin A)^2}{1 - \sin^2 A}} \\
 &= \frac{1 + \sin A}{\sqrt{\cos^2 A}} \quad \left| \begin{array}{l} = \frac{1}{\cos A} + \frac{\sin A}{\cos A} \\ = \sec A + \tan A \end{array} \right. \\
 &= \frac{1 + \sin A}{\cos A} \quad \left| \begin{array}{l} = \sec A + \tan A \\ = \text{RHS} \end{array} \right.
 \end{aligned}$$