



Exercise 7A

Question 28

$$\begin{aligned}
 \text{LHS} &= \frac{\sin \theta}{(\sec \theta + \tan \theta - 1)} + \frac{\cos \theta}{(\csc \theta + \cot \theta - 1)} \\
 &= \frac{\sin \theta}{\left(\frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta} - 1\right)} + \frac{\cos \theta}{\left(\frac{1}{\sin \theta} + \frac{\cos \theta}{\sin \theta} - 1\right)} \\
 &= \frac{\sin \theta \cos \theta}{(1 + \sin \theta - \cos \theta)} + \frac{\cos \theta \sin \theta}{(1 + \cos \theta - \sin \theta)} \\
 &= \frac{\sin \theta \cos \theta (1 + \cos \theta - \sin \theta) + \cos \theta \sin \theta (1 + \sin \theta - \cos \theta)}{(1 + \sin \theta - \cos \theta)(1 + \cos \theta - \sin \theta)} \\
 &= \frac{\sin \theta \cos \theta + \sin \theta \cos^2 \theta - \sin^2 \theta \cos \theta + \cos \theta \sin \theta + \cos \theta \sin^2 \theta - \cos^2 \theta \sin \theta}{(1 + \sin \theta - \cos \theta)(1 + \cos \theta - \sin \theta)} \\
 &= \frac{2 \sin \theta \cos \theta}{1 + \cos \theta - \sin \theta + \sin \theta + \sin \theta \cos \theta - \sin^2 \theta - \cos \theta - \cos^2 \theta + \cos \theta \sin \theta} \\
 &= \frac{2 \sin \theta \cos \theta}{2 \sin \theta \cos \theta} = 1 = \text{RHS}
 \end{aligned}$$

$\therefore \text{LHS} = \text{RHS}$

Question 29

$$\begin{aligned}
 \text{LHS} &= \frac{\sin \theta}{(\sec \theta + \tan \theta - 1)} + \frac{\cos \theta}{(\csc \theta + \cot \theta - 1)} \\
 &= \frac{\sin \theta}{\left(\frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta} - 1\right)} + \frac{\cos \theta}{\left(\frac{1}{\sin \theta} + \frac{\cos \theta}{\sin \theta} - 1\right)} \\
 &= \frac{\sin \theta \cos \theta}{(1 + \sin \theta - \cos \theta)} + \frac{\cos \theta \sin \theta}{(1 + \cos \theta - \sin \theta)} \\
 &= \frac{\sin \theta \cos \theta (1 + \cos \theta - \sin \theta) + \cos \theta \sin \theta (1 + \sin \theta - \cos \theta)}{(1 + \sin \theta - \cos \theta)(1 + \cos \theta - \sin \theta)} \\
 &= \frac{\sin \theta \cos \theta + \sin \theta \cos^2 \theta - \sin^2 \theta \cos \theta + \cos \theta \sin \theta + \cos \theta \sin^2 \theta - \cos^2 \theta \sin \theta}{(1 + \sin \theta - \cos \theta)(1 + \cos \theta - \sin \theta)} \\
 &= \frac{2 \sin \theta \cos \theta}{1 + \cos \theta - \sin \theta + \sin \theta + \sin \theta \cos \theta - \sin^2 \theta - \cos \theta - \cos^2 \theta + \cos \theta \sin \theta} \\
 &= \frac{2 \sin \theta \cos \theta}{2 \sin \theta \cos \theta} = 1 = \text{RHS}
 \end{aligned}$$

$\therefore \text{LHS} = \text{RHS}$

***** END *****