

Q.1 Extra Practice

$$\begin{aligned} \sin^2 x + \cos^2 x &= 1 \\ 1 + \cot^2 x &= \csc^2 x \\ \tan^2 x + 1 &= \sec^2 x \end{aligned}$$

$$7a) \frac{\sec x}{\sin x} - \frac{\sin x}{\cos x}$$

$$\frac{\frac{1}{\cos x}}{\sin x} - \frac{\sin x}{\cos x}$$

$$\frac{1}{\cos x} \cdot \frac{1}{\sin x} - \frac{\sin x}{\cos x}$$

$$\frac{1}{\cos x \sin x} - \frac{\sin x}{\cos x}$$

$$\frac{1}{\cos x \sin x} - \frac{\sin x \cdot \sin x}{\cos x \sin x}$$

$$\frac{1 - \sin^2 x}{\cos x \sin x} = \frac{\cancel{\cos^2 x}}{\cos x \sin x} \text{ (identity)}$$

$$= \frac{\cos x}{\sin x} = \cot x$$

$$b) \cos x + \tan x \sin x$$

$$\cos x + \frac{\sin x \cdot \sin x}{\cos x}$$

$$\frac{\cos x}{1} + \frac{\sin^2 x}{\cos x}$$

$$\frac{\cos^2 x}{\cos x} + \frac{\sin^2 x}{\cos x}$$

$$\frac{\cos^2 x + \sin^2 x \leftarrow \text{identity}}{\cos x} = \frac{1}{\cos x} = \sec x$$