

$$\textcircled{44} \frac{\cot^2 \theta}{\csc \theta + 1}$$

$$\frac{\csc^2 \theta - 1}{\csc \theta + 1}$$

$$\frac{(\csc \theta - 1)(\csc \theta + 1)}{\csc \theta + 1}$$

$$\csc \theta - 1$$

$$\frac{1}{\sin \theta} - 1$$

$$\frac{1}{\sin \theta} - \frac{\sin \theta}{\sin \theta}$$

$$\frac{1 - \sin \theta}{\sin \theta}$$

$$= 1 - \csc \theta$$

$$\frac{\sin^2 \theta + \cos^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta}$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$\therefore \cot^2 \theta = \csc^2 \theta - 1$$

$$1 - \csc \theta$$

$$1 - \frac{1}{\sin \theta}$$

$$\frac{\sin \theta}{\sin \theta} - \frac{1}{\sin \theta}$$

$$\frac{\sin \theta - 1}{\sin \theta}$$

??

$$(2) \quad \csc^2 y + \sec^2 y = \sec^2 y \csc^2 y$$

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

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

$$\frac{1}{\sin^2 y \cos^2 y}$$

$$\frac{1}{\cos^2 y} \cdot \frac{1}{\sin^2 y}$$



$$\frac{1}{\cos^2 y \sin^2 y} \quad \checkmark$$

$$(65) \quad \frac{1 - \sin x}{1 + \sin x} \cdot \frac{1 - \sin x}{1 - \sin x}$$

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

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

$$\sec^2 x - \frac{2(\sin x)}{\cos x \cos x} \quad \downarrow$$

$$\sec^2 x - 2 \tan x \sec x + \tan^2 x$$

Perfect
Square
Trinomial

$$\downarrow \quad \checkmark \quad \downarrow \quad \checkmark$$

$$(\sec x - \tan x)^2$$

$$\underline{\text{or}} \quad (\tan x - \sec x)^2 \quad \checkmark$$