

$$3. \csc^2 x + \sec^2 x = \csc^2 x \sec^2 x$$

$$\rightarrow \csc^2 x + \sec^2 x =$$

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

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

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

$$= \sec^2 x \cdot \csc^2 x //$$

$$4. \cos^2 x \cos^2 y + \sin^2 x \sin^2 y + \sin^2 x \cos^2 y + \sin^2 y \cos^2 x = 1$$

$$\rightarrow \cos^2 x \cos^2 y + \sin^2 x \sin^2 y + \sin^2 x \cos^2 y + \sin^2 y \cos^2 x =$$

$$= \underbrace{(\cos^2 x + \sin^2 x)}_{=1} \cos^2 y + \underbrace{(\sin^2 x + \cos^2 x)}_{=1} \sin^2 y$$

$$= \cos^2 y + \sin^2 y$$

$$= 1 //$$