

Comprobar las siguientes identidades

$$1) \operatorname{tg} \alpha + \operatorname{cotg} \alpha = \operatorname{sec} \alpha \cdot \operatorname{cosec} \alpha$$

$$\frac{\operatorname{sen} \alpha}{\cos \alpha} + \frac{\cos \alpha}{\operatorname{sen} \alpha} =$$

$$\frac{\operatorname{sen}^2 \alpha + \cos^2 \alpha}{\cos \alpha \cdot \operatorname{sen} \alpha} =$$

$$\frac{1}{\cos \alpha \cdot \operatorname{sen} \alpha} =$$

$$\operatorname{sec} \alpha \cdot \operatorname{cosec} \alpha = \operatorname{sec} \alpha \cdot \operatorname{cosec} \alpha$$

$$2) \operatorname{cotg}^2 \alpha = \cos^2 \alpha + (\operatorname{cotg} \alpha \cdot \cos \alpha)^2$$

$$= \cos^2 \alpha + \operatorname{cotg}^2 \alpha \cdot \cos^2 \alpha$$

$$= \cos^2 \alpha \cdot (1 + \operatorname{cotg}^2 \alpha)$$

$$= \cos^2 \alpha \cdot \operatorname{cosec}^2 \alpha$$

$$= \cos^2 \alpha \cdot \frac{1}{\operatorname{sen}^2 \alpha}$$

$$\operatorname{cotg}^2 \alpha = \operatorname{cotg}^2 \alpha$$

$$3) \frac{1}{\operatorname{sec}^2 \alpha} = \operatorname{sen}^2 \alpha \cdot \cos^2 \alpha + \cos^4 \alpha$$

$$= \cos^2 \alpha \cdot (\underbrace{\operatorname{sen}^2 \alpha + \cos^2 \alpha}_1)$$

$$= \cos^2 \alpha$$

$$\frac{1}{\operatorname{sec}^2 \alpha} = \frac{1}{\operatorname{sec}^2 \alpha}$$

$$\cot^2 d \cdot \sec^2 d = \operatorname{cosec}^2 d$$

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

$$\frac{1}{\sin^2 d} = \operatorname{cosec}^2 d$$

$$\boxed{\operatorname{cosec}^2 d = \operatorname{cosec}^2 d}$$

$$\sec^2 d + \operatorname{cosec}^2 d = \frac{1}{\sin^2 d \cdot \cos^2 d}$$

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

$$\frac{\sin^2 d + \cos^2 d}{\cos^2 d \cdot \sin^2 d} =$$

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