

PROBLEMAS DE TRIGONOMETRÍA

Problema 30:

$$\frac{1}{\operatorname{sen}^2 x} - \frac{1}{\operatorname{cos}^2 x} - \frac{1}{\operatorname{tg}^2 x} - \frac{1}{\operatorname{cotg}^2 x} - \frac{1}{\operatorname{sec}^2 x} - \frac{1}{\operatorname{cosec}^2 x} + 3 = 0$$

Solución Problema 30:

$$\frac{1}{\operatorname{sen}^2 x} - \frac{1}{\operatorname{cos}^2 x} - \frac{1}{\operatorname{tg}^2 x} - \frac{1}{\operatorname{cotg}^2 x} - \frac{1}{\operatorname{sec}^2 x} - \frac{1}{\operatorname{cosec}^2 x} + 3 = 0$$

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x - \operatorname{cos}^2 x - \operatorname{sen}^2 x + 3 = 0$$

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x + [(-1)(\operatorname{cos}^2 x + \operatorname{sen}^2 x)] + 3 = 0$$

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x + [(-1)(1)] + 3 = 0$$

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x - 1 + 3 = 0$$

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x + 2 = 0 \text{ ecuación 1}$$

Sabemos que:

$$\operatorname{cosec}^2 x = 1 + \operatorname{cotg}^2 x$$

$$\operatorname{sec}^2 x = 1 + \operatorname{tg}^2 x$$

Restando miembro a miembro, tenemos:

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x = 1 + \operatorname{cotg}^2 x - (1 + \operatorname{tg}^2 x) = 1 + \operatorname{cotg}^2 x - 1 - \operatorname{tg}^2 x$$

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x = \operatorname{cotg}^2 x - \operatorname{tg}^2 x \text{ expresión 1}$$

Sustituyendo la expresión 1 en la ecuación 1, tenemos:

$$\operatorname{cosec}^2 x - \operatorname{sec}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x + 2 = 0 \text{ ecuación 1}$$

$$\operatorname{cotg}^2 x - \operatorname{tg}^2 x - \operatorname{cotg}^2 x - \operatorname{tg}^2 x + 2 = 0$$

$$-2\operatorname{tg}^2 x + 2 = 0$$

$$-2\operatorname{tg}^2 x = -2$$

$$\operatorname{tg}^2 x = \frac{2}{2} = 1$$

PROBLEMAS DE TRIGONOMETRÍA: Problema 30

$$\operatorname{tg} x = 1$$

$$x = \operatorname{arctg} 1 = 45^\circ$$