

PROBLEMAS DE TRIGONOMETRÍA

Problema 212:

Si $\sec^2 a = 3$, ¿cuánto vale

$$\frac{\operatorname{tg}^2 a - \operatorname{cosec}^2 a}{\operatorname{tg}^2 a + \operatorname{cosec}^2 a} ?$$

Solución Problema 212:

$$\sec^2 a = 3$$

Significa que:

$$\sec^2 a = \frac{1}{\cos^2 a}$$

Luego:

$$\cos^2 a = \frac{1}{3}$$

Sabemos que:

$$\operatorname{sen}^2 a = 1 - \cos^2 a = 1 - \frac{1}{3} = \frac{3-1}{3} = \frac{2}{3}$$

Luego

$$\operatorname{cosec}^2 a = \frac{1}{\operatorname{sen}^2 a} = \frac{1}{\frac{2}{3}} = \frac{3}{2}$$

Sabemos que:

$$\operatorname{tg}^2 a = \frac{\operatorname{sen}^2 a}{\cos^2 a} = \frac{\frac{2}{3}}{\frac{1}{3}} = 2$$

Por tanto:

$$\frac{\operatorname{tg}^2 a - \operatorname{cosec}^2 a}{\operatorname{tg}^2 a + \operatorname{cosec}^2 a} = \frac{2 - \frac{3}{2}}{2 + \frac{3}{2}} = \frac{\frac{4-3}{2}}{\frac{4+3}{2}} = \frac{1}{7}$$