PROBLEMAS DE TRIGONOMETRÍA

Problema 40:

Demostrar que se verifica la siguiente igualdad:

$$\text{ctg}^2\text{a} - \text{tg}^2\text{a} = \frac{4cos2a}{\text{sen}^2 2\text{a}}$$

Solución Problema 40:

$$\text{ctg}^2\text{a} - \text{tg}^2\text{a} = \frac{4cos2a}{\text{sen}^2 2\text{a}}$$

$$\frac{4cos2a}{\text{sen}^2 2\text{a}} = \frac{4(\cos^2\text{a} - \text{sen}^2\text{a})}{sen2\text{a}.sen2\text{a}} = \frac{\cancel{4}(\cos^2\text{a} - \text{sen}^2\text{a})}{\cancel{2}senacosa.\cancel{2}sen\text{acosa}} =$$

$$\frac{\cos^2\text{a} - \text{sen}^2\text{a}}{senacosa.sen\text{a}.\cos\text{a}} = \frac{\cos^2\text{a} - \text{sen}^2\text{a}}{\text{sen}^2\text{a}.\cos^2\text{a}} = \frac{\cancel{\cos^2\text{a}}}{\text{sen}^2\text{a}.\cancel{\cos^2\text{a}}} - \frac{\cancel{\text{sen}^2\text{a}}}{\cancel{\text{sen}^2\text{a}}.\cos^2\text{a}} =$$

$$\frac{1}{\text{sen}^2\text{a}} - \frac{1}{\cos^2\text{a}} = \text{cosec}^2\text{a} - \sec^2\text{a} = 1 + \text{ctg}^2\text{a} - (1 + \text{tg}^2\text{a}) =$$

$$1 + \text{ctg}^2\text{a} - 1 - \text{tg}^2\text{a} = \mathbf{ctg^2a - tg^2a}$$