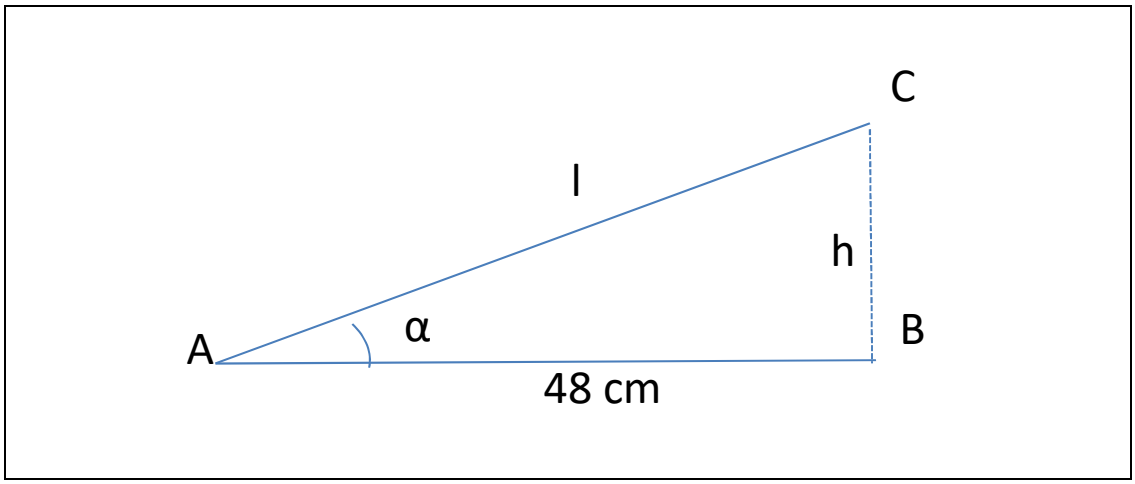
PROBLEMAS DE TRIGONOMETRÍA

Problema 100:

De un triángulo rectángulo se sabe que su área es 864 cm^2 y un cateto mide 48 cm. Calcula las razones trigonométricas de sus ángulos

Solución Problema 100:

Hacemos el croquis:



En el triángulo ABC:

$$A = \frac{\text{b.h}}{2}$$

$$864 = \frac{48.\text{h}}{2}$$

$$h = \frac{864.2}{48} = 36\ cm$$

Aplicando el teorema de Pitágoras:

$$l = \sqrt{36^2+48^2} = \sqrt{1296+2304} = \sqrt{3600} = 60$$

Razones trigonométricas de α:

$$tg\ \alpha = \frac{\text{h}}{x} = \frac{36}{48} = 0{,}75$$

$$cotg\ \alpha = \frac{\text{x}}{\text{h}} = \frac{48}{36} = 1{,}333\ldots$$

$$sen\ \alpha = \frac{\mathrm{h}}{l} = \frac{36}{60} = 0{,}6$$

$$cosec\ \alpha = \frac{\mathrm{l}}{\mathrm{h}} = \frac{60}{36} = 1{,}666\ldots$$

$$cos\ \alpha = \frac{\mathrm{x}}{l} = \frac{48}{60} = 0{,}8$$

$$sec\ \alpha = \frac{\mathrm{l}}{x} = \frac{60}{48} = 1{,}25$$

Razones trigonométricas de 90-α:

$$tg\ (90 - \alpha) = cotg\ \alpha = 1{,}333\ldots$$

$$cotg\ (90 - \alpha) = tg\ \alpha = 0{,}75$$

$$sen\ (90 - \alpha) = cos\ \alpha = 0{,}8$$

$$cosec\ (90 - \alpha) = sec\ \alpha = 1{,}25$$

$$cos\ (90 - \alpha) = sen\ \alpha = 0{,}6$$

$$sec\ (90 - \alpha) = cosec\ \alpha = 1{,}666\ldots$$

Razones trigonométricas de 90:

$$tg\ 90 = \infty$$

$$cotg\ 90 = 0$$

$$sen\ 90 = 1$$

$$cosec\ 90 = 1$$

$$cos\ 90 = 0$$

$$sec\ 90 = \infty$$