

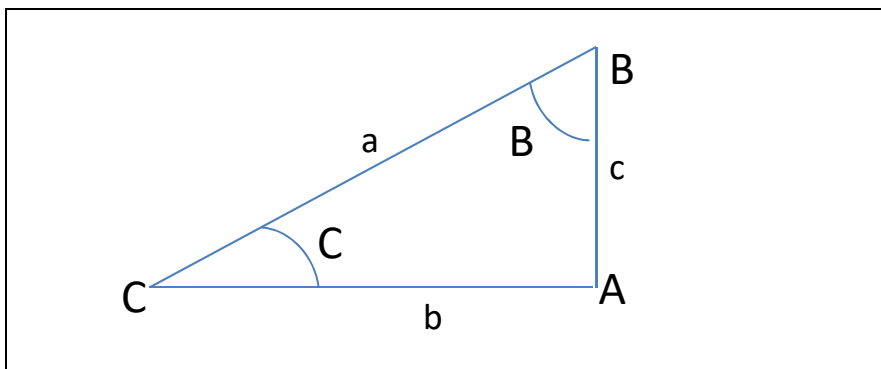
PROBLEMAS DE TRIGONOMETRÍA

Problema 124:

El perímetro de un triángulo rectángulo es de 140,88 m, y $B=61^{\circ} 10' 4'',8$. Hallar los demás elementos.

Solución Problema 124:

Hacemos el croquis:



Sabemos que:

$$a + b + c = 140,88 \text{ m ecuación 1}$$

$$B = 61^{\circ} 10' 4'',8$$

Pasamos el valor de B a grados:

$$\frac{10}{60} = 0,166666^{\circ}$$

$$\frac{4'',8}{3600} = 0,001333^{\circ}$$

Luego,

$$B = 61^{\circ} 10' 4'',8 = 61^{\circ} + 0,166666^{\circ} + 0,001333^{\circ} = 61,1678^{\circ}$$

Hallamos el ángulo C:

$$C = 90 - B = 90 - 61,1678^{\circ} = 28^{\circ},832001 = 28^{\circ} 49' 55'',20$$

$$\text{tg } B = \frac{b}{c}$$

$$\operatorname{tg} 61,1678^\circ = \frac{b}{c}$$

$$b = c \cdot \operatorname{tg} 61,1678^\circ = 1,816574c$$

$$\cos B = \frac{c}{a}$$

$$a = \frac{c}{\cos B} = \frac{c}{\cos 61,1678^\circ} = \frac{c}{0,482246}$$

Sustituyendo en la ecuación 1:

$$a + b + c = 140,88$$

$$\frac{c}{0,482246} + 1,816574c + c = 140,88$$

$$c + 0,876035c + 0,482246c = 67,938816$$

$$2,358281c = 67,938816$$

$$c = \frac{67,938816}{2,358281} = 28,808617 \text{ m aproximadamente}$$

$$a = \frac{c}{0,482246} = \frac{28,808617}{0,482246} = 59,738427 \text{ m aproximadamente}$$

$$b = 1,816574c = 1,816574 \cdot 28,808617 = 52,333 \text{ m aproximadamente}$$