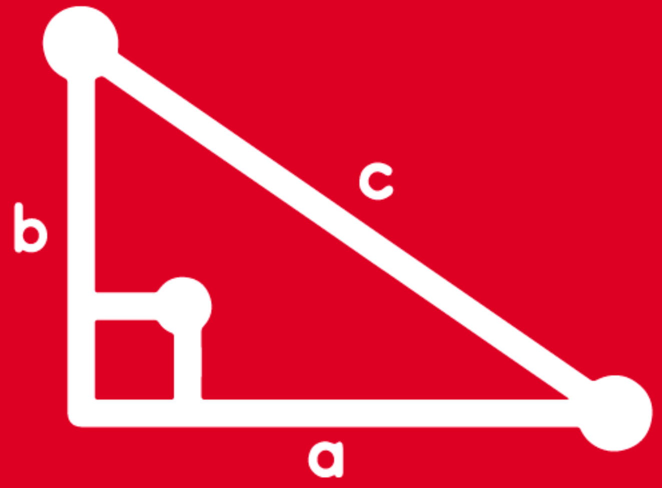
TRIGONOMETRY

TOMO 2

2nd
SECONDARY



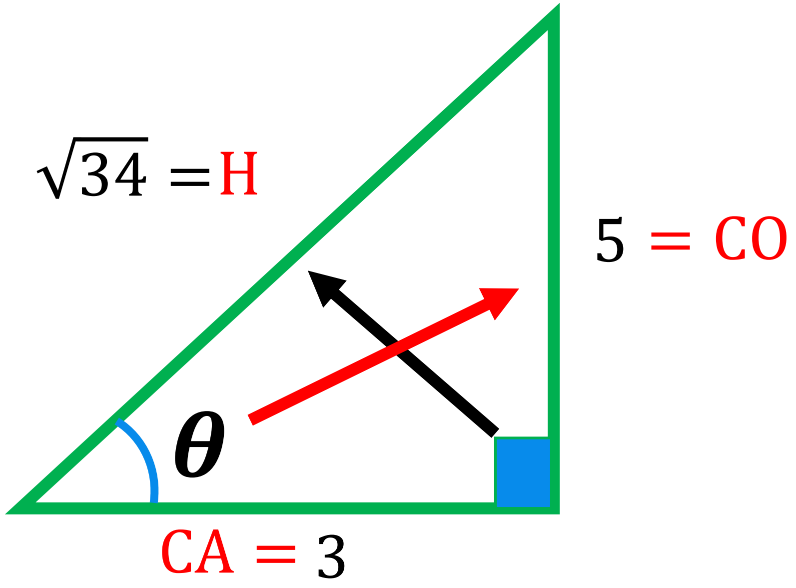
FEEDBACK

SACO OLIVEROS

HELICO-REVIEW 1

De la figura, efectúe:

$$M = \sqrt{34}\cos\theta + 6\tan\theta$$



$\cos\theta = \dfrac{ca}{h}$ $\quad$ $\tan\theta = \dfrac{co}{ca}$

Resolución:

Teorema de Pitágoras:

$$(\mathbf{H})^2 = (\mathbf{5})^2 + (\mathbf{3})^2$$

$$(\mathbf{H})^2 = \mathbf{25} + \mathbf{9}$$

$$(\mathbf{H})^2 = \mathbf{34} \Rightarrow \mathbf{H} = \sqrt{\mathbf{34}}$$

Calculamos:

$$M = \sqrt{34}\cos\theta + 6\tan\theta$$

$$M = \cancel{\sqrt{34}} \times \left(\frac{3}{\cancel{\sqrt{34}}}\right) + \overset{2}{\cancel{6}} \times \left(\frac{5}{\underset{1}{\cancel{3}}}\right)$$

$$M = 3 + 10$$

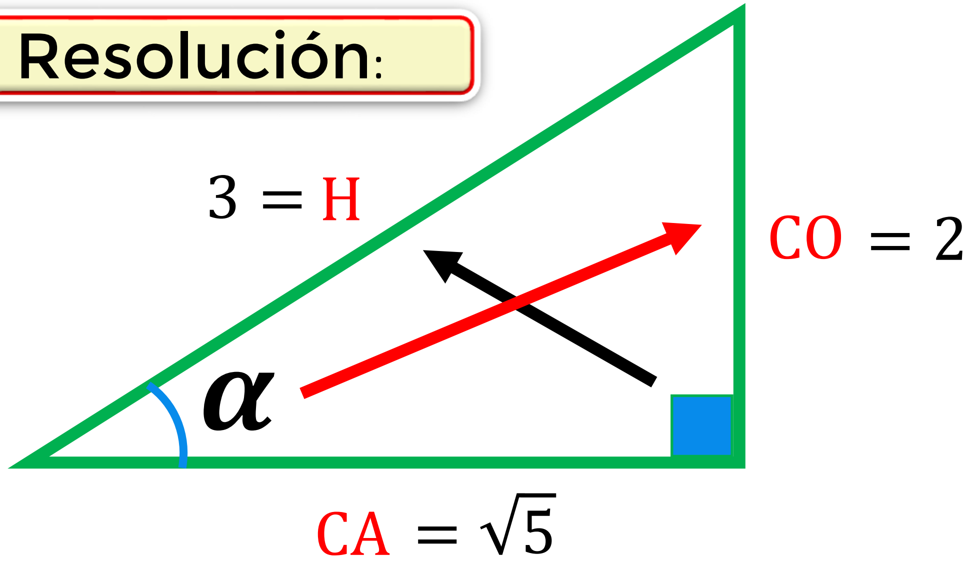
$$\therefore \mathbf{M = 13}$$

HELICO-REVIEW 2

Si $\boldsymbol{sen\,\alpha = \frac{2}{3}}$, siendo "$\boldsymbol{\alpha}$" un ángulo agudo, efectúe

$$C = 9\cos^2\alpha + 9$$

Resolución:



$\mathrm{Sen}\,\theta = \frac{co}{h}$ $\quad$ $\mathrm{Cos}\,\theta = \frac{ca}{h}$

Del dato:

$$\mathrm{sen}\,\alpha = \frac{2}{3} = \frac{CO}{H}$$

Teorema de Pitágoras:

$$(CA)^2 + (2)^2 = (3)^2$$
$$(CA)^2 + 4 = 9$$
$$(CA)^2 = 5 \Rightarrow CA = \sqrt{5}$$

Calculamos: $C = 9\,cos^2\,\alpha + 9$

$$C = 9 \times \left(\frac{\sqrt{5}}{3}\right)^2 + 9$$

$$C = \cancel{9} \times \frac{5}{\cancel{9}} + 9$$

$$\therefore \boldsymbol{C = 14}$$

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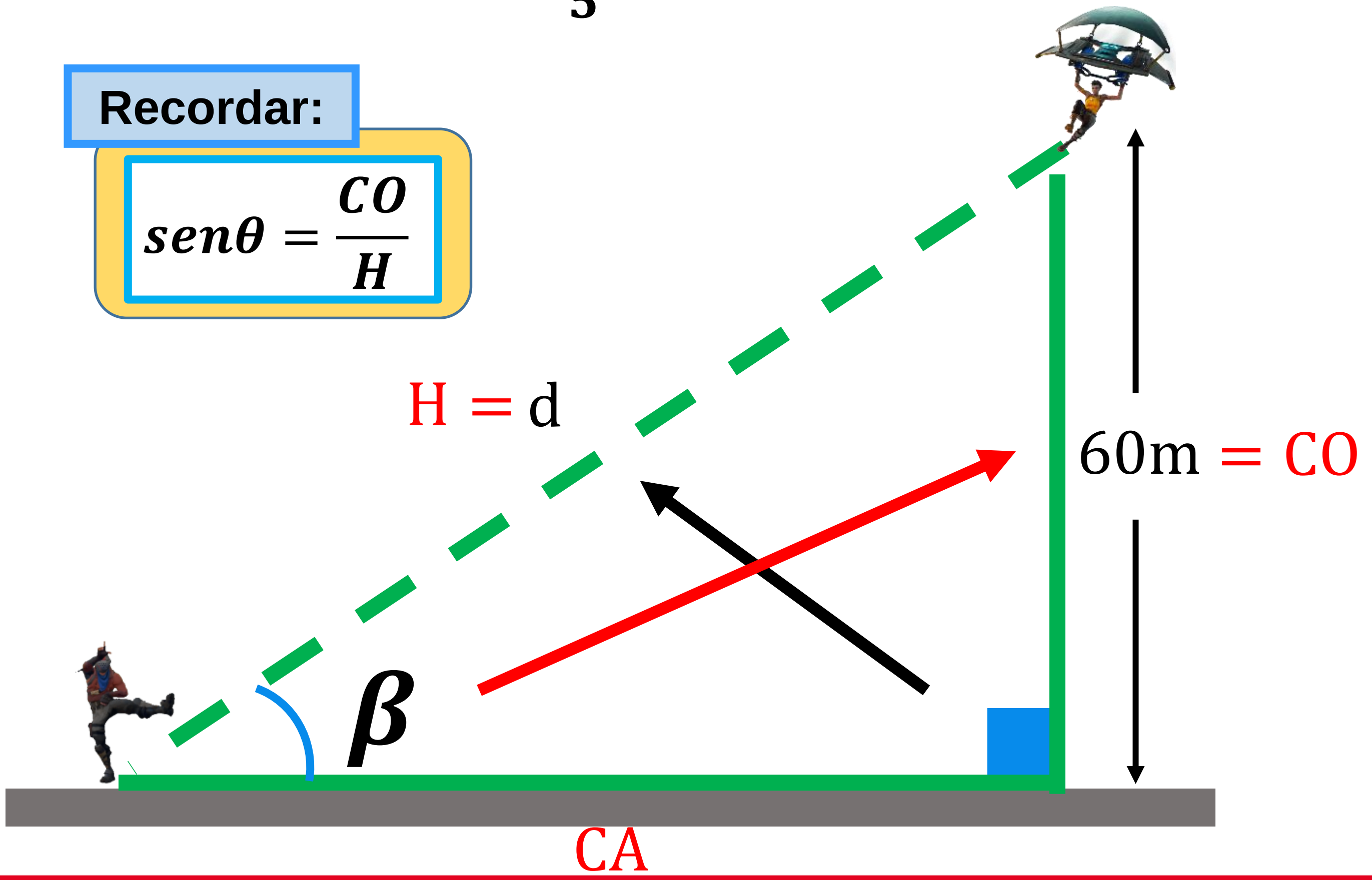
HELICO-REVIEW 3

María se encuentra a **60m** de altura desde donde observa a José y se dirige hacia él, tal como se muestra en la figura. Determine la distancia **d** entre María y José,

Considere: $sen\,\beta = \dfrac{3}{5}$

Recordar:

$$sen\theta = \frac{CO}{H}$$



Resolución:

Del dato: $\text{sen}\,\beta = \dfrac{3}{5} \quad \cdots(1)$

Del gráfico:

$$\text{sen}\,\beta = \frac{60}{d} \quad \cdots(2)$$

Igualando (1) y (2):

$$\frac{3}{5} = \frac{60}{d}$$

$$3d = 5 \times 60$$

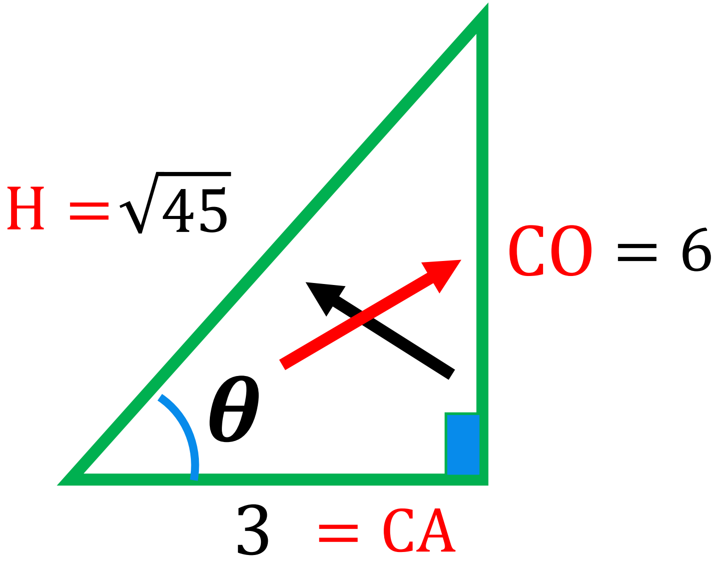
$$d = \frac{5 \times \cancel{60}^{\,20}}{\cancel{3}_{\,1}}$$

$$\therefore\ \mathbf{d = 100\ m}$$

HELICO-REVIEW 4

Del gráfico, efectúe:

$$P = 6\cot\theta - 1$$



Recordar:

$$\cot\theta = \frac{CA}{CO}$$

Resolución:

Teorema de Pitágoras:

$$(CO)^2 + (3)^2 = \left(\sqrt{45}\right)^2$$

$$(CO)^2 + 9 = 45$$

$$(CO)^2 = 36 \Rightarrow CO = 6$$

Calculamos:

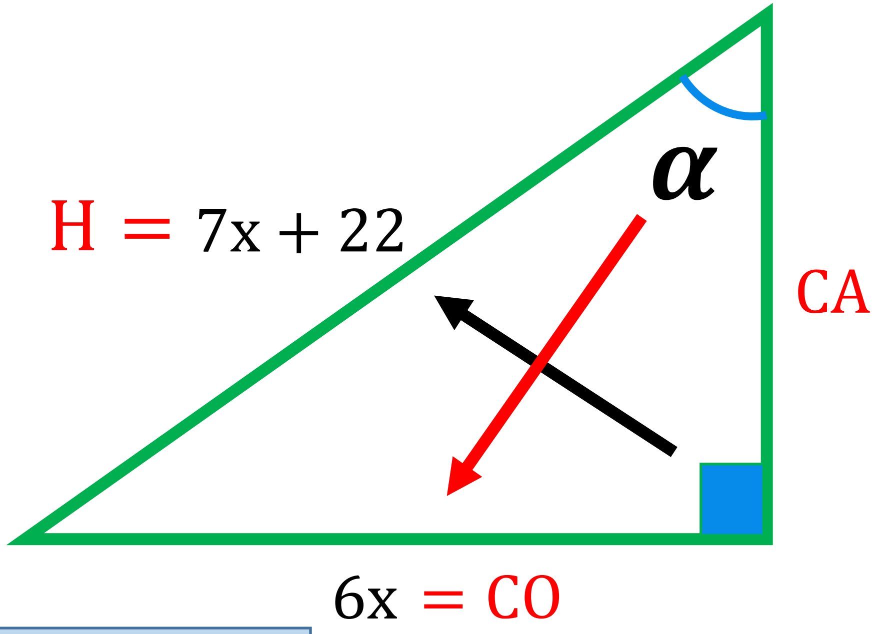
$$P = 6\cot\theta - 1$$

$$P = \cancel{6} \times \left(\frac{3}{\cancel{6}}\right) - 1$$

$$\therefore P = 2$$

HELICO-REVIEW 5

Del gráfico, calcule x si $csc\,\alpha = 3$



Recordar:

$$\csc\theta = \frac{H}{CO}$$

Resolución:

Del dato: $\csc\alpha = \dfrac{3}{1} \quad \cdots (1)$

Del gráfico, se observa

$$\csc\alpha = \frac{(7x+22)}{6x} \quad \cdots (2)$$

Igualando (1) y (2):

$$\frac{3}{1} = \frac{(7x+22)}{6x}$$

$$3(6x) = 1(7x+22)$$

$$18x = 7x + 22$$

$$11x = 22$$

$$\therefore\ x = 2$$

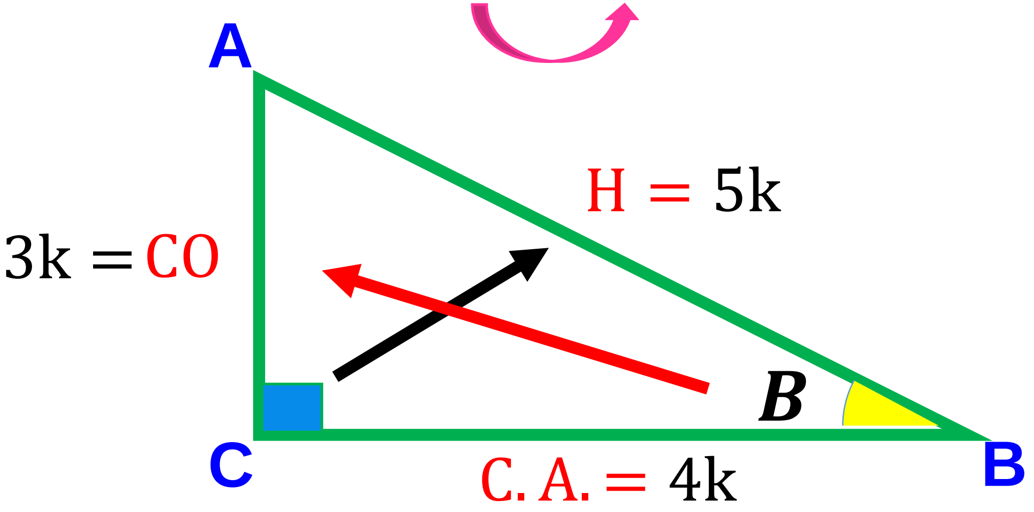
HELICO-REVIEW 6

En un triángulo rectángulo ABC, recto en C, el cateto adyacente al vértice B mide **16m.** Calcule el perímetro de dicho triángulo, sabiendo que $\sec B = \frac{5}{4}$.

Resolución:

Del enunciado:

$$\sec B = \frac{5K}{4K} = \frac{\text{Hipotenusa}}{\text{Cateto Adyacente}}$$



Teorema de Pitágoras:

$$(CO)^2 + (4k)^2 = (5k)^2$$

$$(CO)^2 + 16k^2 = 25k^2$$

$$(CO)^2 = 9k^2 \Rightarrow CO = 3k$$

Luego:

$$C.A.(B) = 16m$$

$$4k = 16m \Rightarrow k = 4m$$

Calculamos:

$$2p = 3k + 4k + 5k$$

$$2p = 12k = 12(4)$$

$$\therefore 2p = 48m$$

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HELICO-REVIEW 7

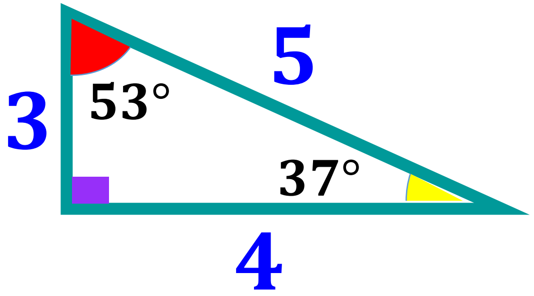
Dadas las columnas, relacione:

I. $\dfrac{\operatorname{sen} 37°}{\cot 53°}$ a. $\dfrac{\sqrt{5}}{2}$

II. $\cos^2 37°$ b. $\dfrac{16}{25}$

III. $\sqrt{\sec 37°}$ c. $\dfrac{4}{5}$

Recordar:



Resolución:

I. $\dfrac{\operatorname{sen} 37°}{\cot 53°} = \dfrac{\frac{3}{5}}{\frac{3}{4}} = \dfrac{\cancel{3} \times 4}{5 \times \cancel{3}} = \dfrac{4}{5}$

II. $\cos^2 37° = \left(\dfrac{4}{5}\right)^2 = \dfrac{16}{25}$

III. $\sqrt{\sec 37°} = \sqrt{\dfrac{5}{4}} = \dfrac{\sqrt{5}}{\sqrt{4}} = \dfrac{\sqrt{5}}{2}$

$\therefore$ Ic; IIb; IIIa

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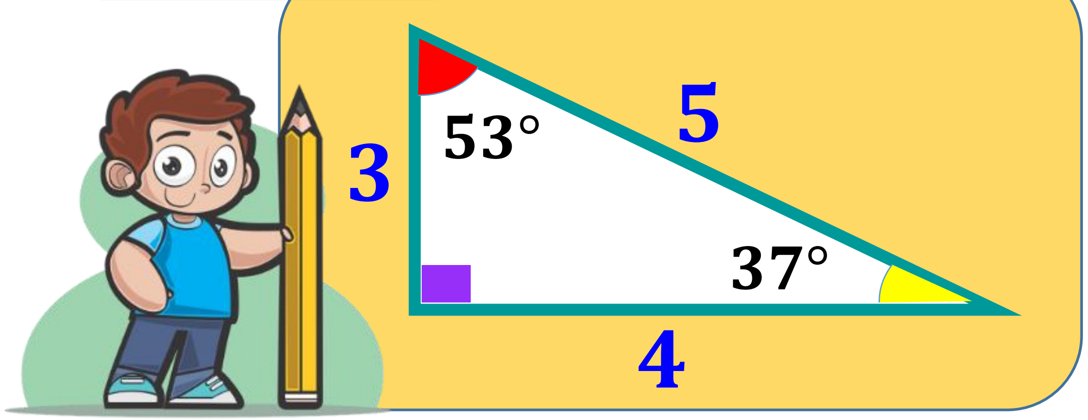
HELICO-REVIEW 8

Calcule x si

$$81^{\csc 53°} = 3^x$$

Recordar:



Resolución:

$$81^{\csc 53°} = 3^x$$

$$(3^4)^{\frac{5}{4}} = 3^x$$

$$3^{\left(\frac{(\cancel{4})(5)}{\cancel{4}}\right)} = 3^x$$

$$3^{(5)} = 3^x$$

$$\boxed{\therefore\ x = 5}$$

HELICO-REVIEW 9

Calcule a , si:

$$3a\,sec\,53° + 20\,tan\,37° = 21\,sec\,37°\,cot\,37°$$

Resolución:

$$3a\sec 53° + 20\tan 37° = 21\sec 37°\cot 37°$$

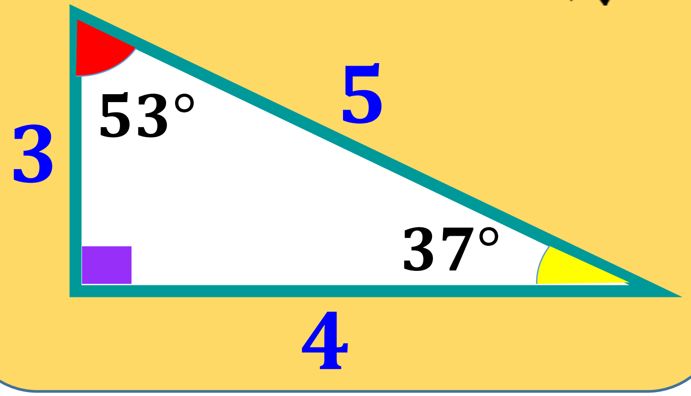
$$\cancel{3}a \times \left(\frac{5}{\cancel{3}}\right) + \overset{5}{\cancel{20}} \times \left(\frac{3}{\underset{1}{\cancel{4}}}\right) = \overset{7}{\cancel{21}} \times \left(\frac{5}{\cancel{4}}\right) \times \left(\frac{\cancel{4}}{\underset{1}{\cancel{3}}}\right)$$

$$5a + 15 = 35$$

$$5a = 20$$

$$\boxed{\therefore a = 4}$$

Recordar:



HELICO-REVIEW 10

Rodrigo es un niño que le gusta cuidar su salud, diariamente sale a correr 30 min alrededor del parque que esta cerca a su casa (el parque tiene forma rectangular, ver figura). Determine el total de metros que recorre en una vuelta.

Resolución:

$$100\,sen\,53°\,m = \cancel{100}^{20} \times \left(\frac{4}{\cancel{5}_{1}}\right)$$

$$\boldsymbol{100\,sen\,53°\,m = 80m}$$

$$90\csc 37°\,\mathrm{m} = \cancel{90}^{30} \times \left(\frac{5}{\cancel{3}_{1}}\right)$$

$$\boldsymbol{90\,csc\,37°\,m = 150m}$$

Perímetro del parque: $2p = 80 + 150 + 80 + 150$

$$\Rightarrow \boldsymbol{2p = 460m}$$

$\therefore$**En una vuelta Rodrigo recorre $460m$**