



# TRIGONOMETRY

TOMO 3 y 4

**1st**  
SECONDARY

ADVISORY



 **SACO OLIVEROS**

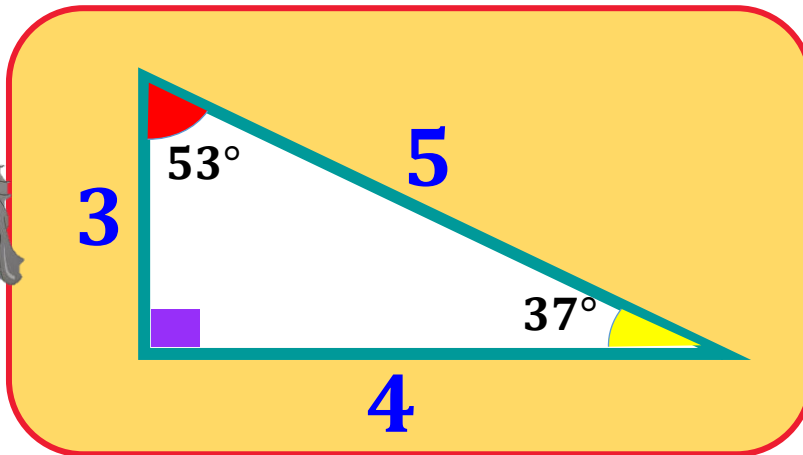
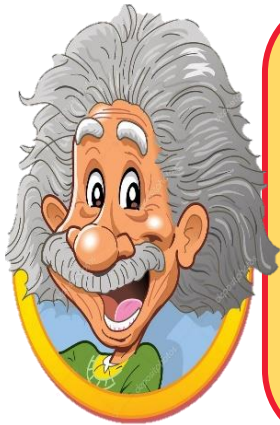


# HELICOPRACTICE 1

Calcule el valor de  $y$ .

$$y - \tan 53^\circ = \csc 37^\circ + \cot 37^\circ$$

Recordar:



Resolución:

$$y - \tan 53^\circ = \csc 37^\circ + \cot 37^\circ$$

$$y - \left(\frac{4}{3}\right) = \frac{5}{3} + \frac{4}{3}$$

$$y - \frac{4}{3} = \frac{9}{3}$$

$$y = \frac{9}{3} + \frac{4}{3}$$

$$\therefore y = \frac{13}{3}$$

¡Genial!



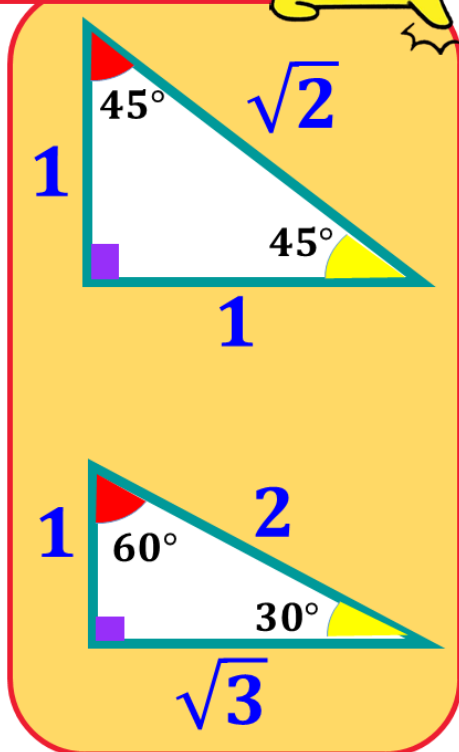
# HELICOPRACTICE 2



Calcule el valor

$$M = \frac{16 \cot 45^\circ + 8 \cos 60^\circ}{\sec^2 45^\circ}$$

Recordar:



Resolución:

$$M = \frac{16 \cot 45^\circ + 8 \cos 60^\circ}{\sec^2 45^\circ}$$

$$M = \frac{16 \times (1) + \cancel{8}^4 \times \left( \frac{1}{\cancel{2}} \right)^1}{(\sqrt{2})^2}$$

$$M = \frac{16 + 4}{2} = \frac{20}{2}$$

$$\therefore M = 10$$

¡Genial!



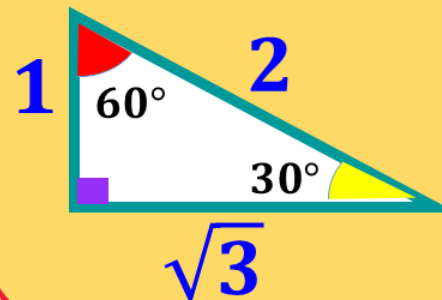
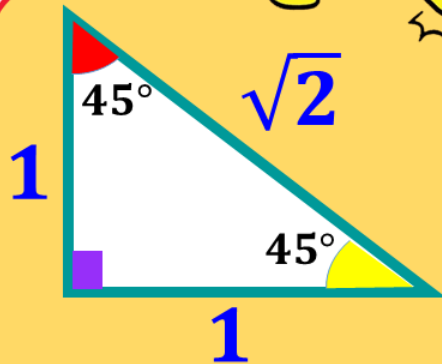
# HELICOPRACTICE 3



Calcule el valor de  $x$ .

$$x \cot^2 30^\circ - 4 \sec 60^\circ = 7 \cot 45^\circ$$

Recordar:



Resolución:

$$x \cot^2 30^\circ - 4 \sec 60^\circ = 7 \cot 45^\circ$$

$$x (\cancel{\sqrt{3}})^2 - 4 (2) = 7 (1)$$

$$3x - 8 = 7$$

$$3x = 15$$

$$x = \frac{15}{3}$$

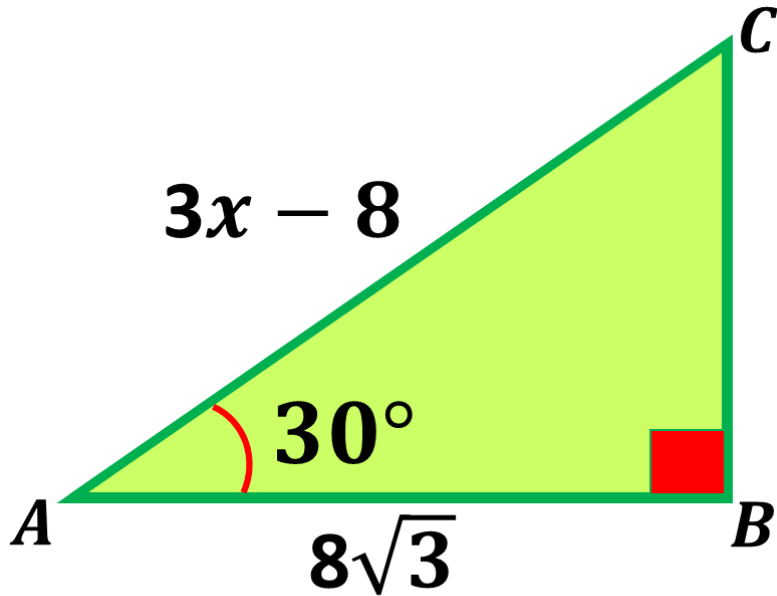
$$\therefore x = 5$$

¡Lo lograste!

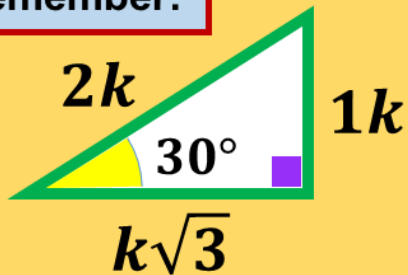




Del gráfico, calcule el valor de  $x$



Remember:



Resolución:

En el  $\triangle ABC$  (Notable de  $30^\circ$  y  $60^\circ$ )

Se observa:

$$k\cancel{\sqrt{3}} = 8\cancel{\sqrt{3}} \Rightarrow k = 8$$

Luego:

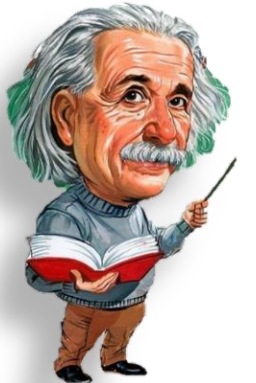
$$3x - 8 = 2k$$

$$\Rightarrow 3x - 8 = 2(8)$$

$$3x - 8 = 16$$

$$3x = 24$$

¡Muy bien!



$$\therefore x = 8$$

# HELICOPRACTICE 5



Alessandro y Raúl tienen  $a$  y  $b$  años, respectivamente. Averigüe quién de los dos es el mayor si se cumplen las siguientes condiciones

$$\text{sen}(3a + 10)^\circ \cdot \text{csc}(4a - 7)^\circ = 1 \quad \text{y} \quad \tan(5b - 6)^\circ \cdot \cot(4b + 11)^\circ = 1$$

Resolución:

Recordar:



$$\text{sen}\alpha \cdot \text{csc}\alpha = 1$$

$$\tan\alpha \cdot \cot\alpha = 1$$

$$\text{sen}(3a + 10)^\circ \cdot \text{csc}(4a - 7)^\circ = 1$$

$$3a + 10 = 4a - 7$$

$$7 + 10 = 4a - 3a$$

$$17 = a$$

*Edad de Alessandro = 17*

$$\tan(5b - 5)^\circ \cdot \cot(4b + 11)^\circ = 1$$

$$5b - 5 = 4b + 11$$

$$5b - 4b = 11 + 5$$

$$b = 16$$

*Edad de Raúl = 16*

¡Muy bien!



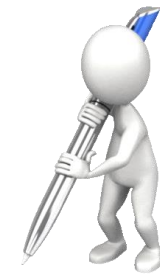
**∴ El mayor es Alessandro**

# HELICOPRACTICE 6



Resolución:

¡Sigue así!



Calcule  $M = \frac{a+b}{c}$  si

$$\begin{aligned}\operatorname{sen} 2a &= \cos 70^\circ \\ \tan b &= \cot 40^\circ \\ \sec 42^\circ &= \csc 4c\end{aligned}$$

Recordar

$\text{Si } \theta + \beta = 90^\circ$

$$\operatorname{sen} \theta = \cos \beta$$

$$\tan \theta = \cot \beta$$

$$\sec \theta = \csc \beta$$

$$\operatorname{sen} 2a = \cos 70^\circ$$

$$2a + 70^\circ = 90^\circ$$

$$2a = 20^\circ$$

$$a = 10^\circ$$

$$\tan b = \cot 40^\circ$$

$$b + 40^\circ = 90^\circ$$

$$b = 50^\circ$$

$$\sec 42^\circ = \csc 4c$$

$$42^\circ + 4c = 90^\circ$$

$$4c = 48^\circ$$

$$c = 12^\circ$$

Piden:

$$M = \frac{a+b}{c} = \frac{10^\circ + 50^\circ}{12^\circ}$$

$$M = \frac{60^\circ}{12^\circ}$$

$$\therefore M = 5$$



Calcule el valor de  $\cot(4x + 5^\circ)$  si

$$\operatorname{sen}(4x + 10^\circ) \cdot \operatorname{csc}(3x + 20^\circ) = 1$$

Resolución:

$$\operatorname{sen}(4x + 10^\circ) \cdot \operatorname{csc}(3x + 20^\circ) = 1$$

$$4x + 10^\circ = 3x + 20^\circ$$

$$4x - 3x = 20^\circ - 10^\circ$$

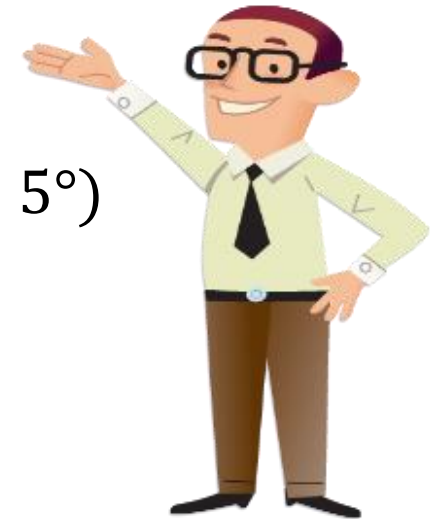
$$x = 10^\circ$$

Remember:

$$\operatorname{sen} \alpha \cdot \operatorname{csc} \alpha = 1$$



¡Genial!



Piden:

$$\cot(4x + 5^\circ) = \cot(4(10^\circ) + 5^\circ)$$

$$\cot(4x + 5^\circ) = \cot 45^\circ$$

$$\cot(4x + 5^\circ) = 1$$

$$\therefore \cot(4x + 5^\circ) = 1$$





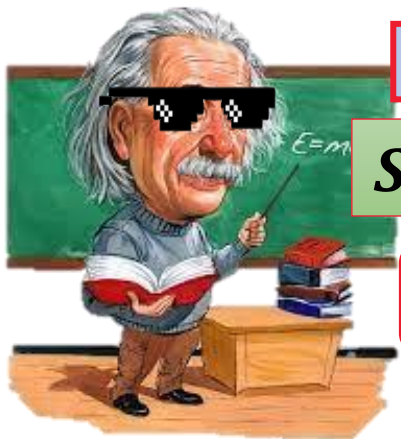
Calcule el valor de  $\text{sen}(3\beta + 7^\circ)$ , si

$$\tan(\beta + 20^\circ) = \cot(3\beta + 30^\circ)$$

Resolución:

$$\tan(\beta + 20^\circ) = \cot(3\beta + 30^\circ)$$

$$\beta + 20^\circ + 3\beta + 30^\circ = 90^\circ$$



Remember:

$$SI: \alpha + \beta = 90^\circ$$

$$\tan \alpha = \cot \beta$$

$$4\beta = 90^\circ - 50^\circ$$

$$\cancel{4}\beta = \cancel{40}^\circ \longrightarrow \beta = 10^\circ$$

Reemplazamos:

$$\text{sen}(3\beta + 7^\circ) = \text{sen}(3(10^\circ) + 7^\circ)$$

$$\text{sen}(3\beta + 7^\circ) = \text{sen}37^\circ$$

¡Excelente  
Campeón!





Calcule el valor de  $\varphi$  si

$$\text{sen}7\varphi \cdot \text{sec}20^\circ = 1$$

**Recordamos:**

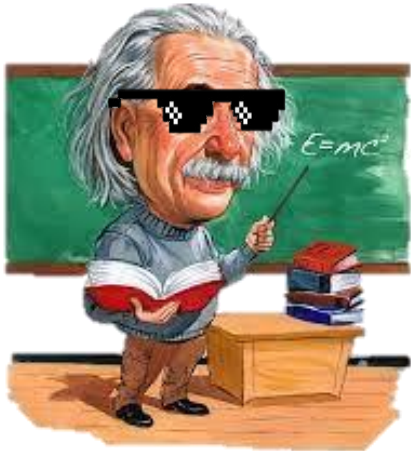
R.T Complementarias

$$SI: \alpha + \beta = 90^\circ$$

$$\text{sec } \alpha = \text{csc } \beta$$

R.T Reciprocas

$$\text{sen } \beta \cdot \text{csc } \beta = 1$$



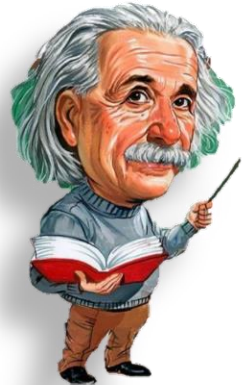
Resolución:

$$\text{sen}7\varphi \cdot \underbrace{\text{sec}20^\circ}_{\text{csc}70^\circ} = 1$$

$$\text{sen}7\varphi \cdot \underbrace{\text{csc}70^\circ}_{\text{sen}20^\circ} = 1$$

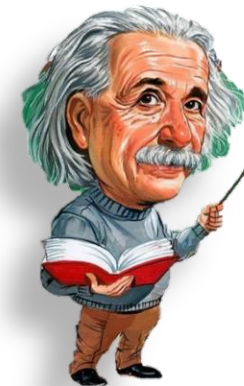
$$\cancel{7}\varphi = \cancel{7}0^\circ$$

**¡Genial!**



# HELICOPRACTICE 10

¡Muy bien!



Calcule el valor de  $\tan(x + y)$  si

$$\tan(2x + 15^\circ) \cdot \cot(4x - 25^\circ) = 1 \quad \dots (a)$$

$$\sec(2y + 16^\circ) = \csc(y + 23^\circ) \quad \dots (b)$$

Recordamos:

R.T Complementarias

Si:  $\alpha + \beta = 90^\circ$

$$\sec(\alpha) = \csc(\beta)$$

R.T Reciprocas

$$\tan\varphi \cdot \cot\varphi = 1$$

Resolución:

En (a)

$$\tan(2x + 15^\circ) \cdot \cot(4x - 25^\circ) = 1$$

$$2x + 15^\circ = 4x - 25^\circ$$

$$40^\circ = 2x$$

$$x = 20^\circ$$

Piden:  $\tan(x + y) = \tan(37^\circ)$

En (b)

$$\sec(2y + 16^\circ) = \csc(y + 23^\circ)$$

$$2y + 16 + y + 23^\circ = 90^\circ$$

$$3y = 90 - 39^\circ$$

$$3y = 51^\circ$$

$$y = 17^\circ$$

