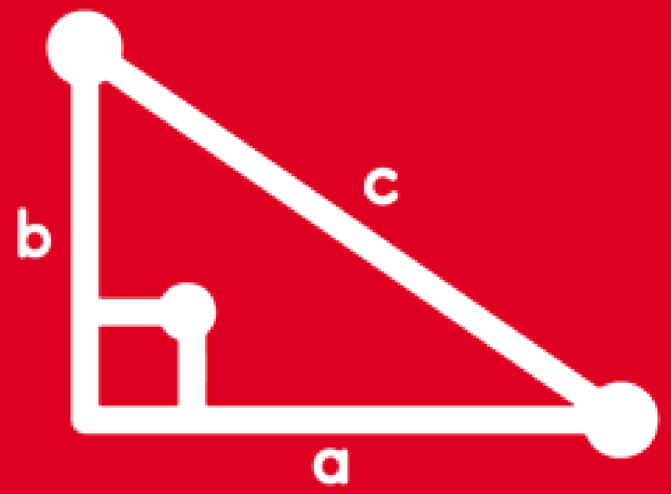
TRIGONOMETRY

ALFREDO



5th
SECONDARY

Advisory

SACO OLIVEROS

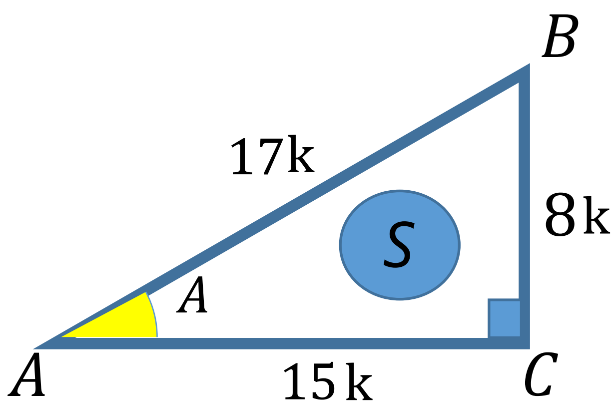
HELICO-PRACTICE 1

Juan adquiere como herencia un terreno en forma de triángulo rectángulo; se sabe que el perímetro de dicho terreno es 160m y la cosecante de uno de sus ángulos agudos es 2,125. Calcule el área de dicho terreno.

Resolución:

Del dato:

$cscA = 2,125 \Rightarrow cscA = \frac{17}{8}$

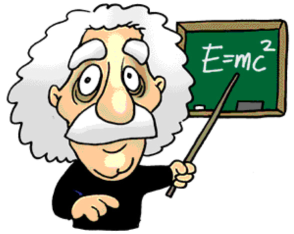


Teorema de Pitágoras:

$$CA^2 + 8^2 = 17^2$$

$$CA^2 + 64 = 289$$

$$CA^2 = 225 \Rightarrow CA = 15$$



$cscA = \frac{H}{CO}$

Perímetro = 160

$\Rightarrow 17k + 15k + 8k = 160$

$40k = 160 \Rightarrow k = 4$

Área: $S = \frac{(15k)(8k)}{2}$

Reemplazando k:

$$S = \frac{(60)(32)}{2}$$

$$\therefore \boxed{S = 960\,m^2}$$

HELICO-PRACTICE 2

Si:

sen(2x – 8°)csc(24° + x) = 1

tan(2y + 25°) = cot(y + 26°)

Calcule Q = tan(x+y)

Resolución:

Dato 1: $sen(2x-8°).csc(24°+x)=1$

RT recíprocas:

$$2x-8°=24°+x$$

$$\boldsymbol{x=32°}$$

Dato 2: $\tan(2y+25°)=\cot(y+26°)$

RT de ángulos complementarios:

$$2y+25°+y+26°=90°$$

$$3y=39°$$

$$\boldsymbol{y=13°}$$

1) R.T. RECÍPROCAS

senα.cscα =1
cosα.secα =1
tanα.cotα =1

Iguales

2) R.T. DE ÁNGULOS COMPLEMENTARIOS

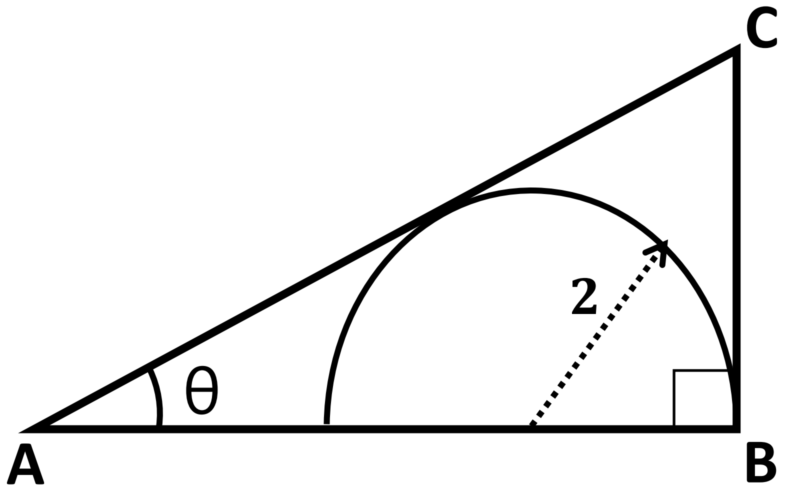
senα=cosβ
tanα=cotβ
secα=cscβ

…uman 90°

∴ Q = 1

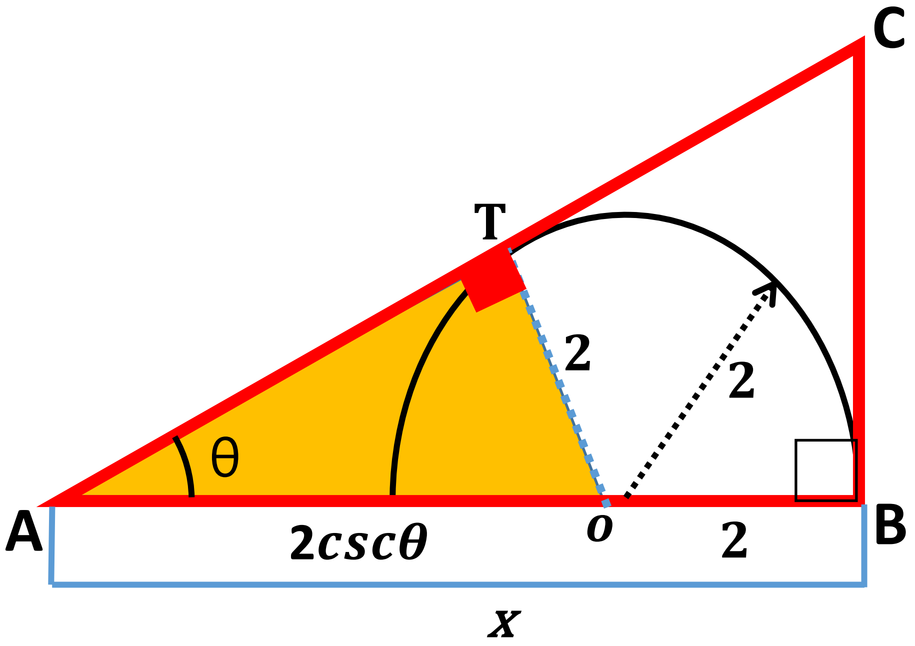
HELICO-PRACTICE 3

En el gráfico mostrado, halle AB en términos de θ.



Resolución:

$$RT(\alpha) = \frac{LO\ QUE\ QUIERO}{LO\ QUE\ TENGO}$$



OTA: $\frac{AO}{2} = \csc\theta$ ➡ $AO = 2\csc\theta$

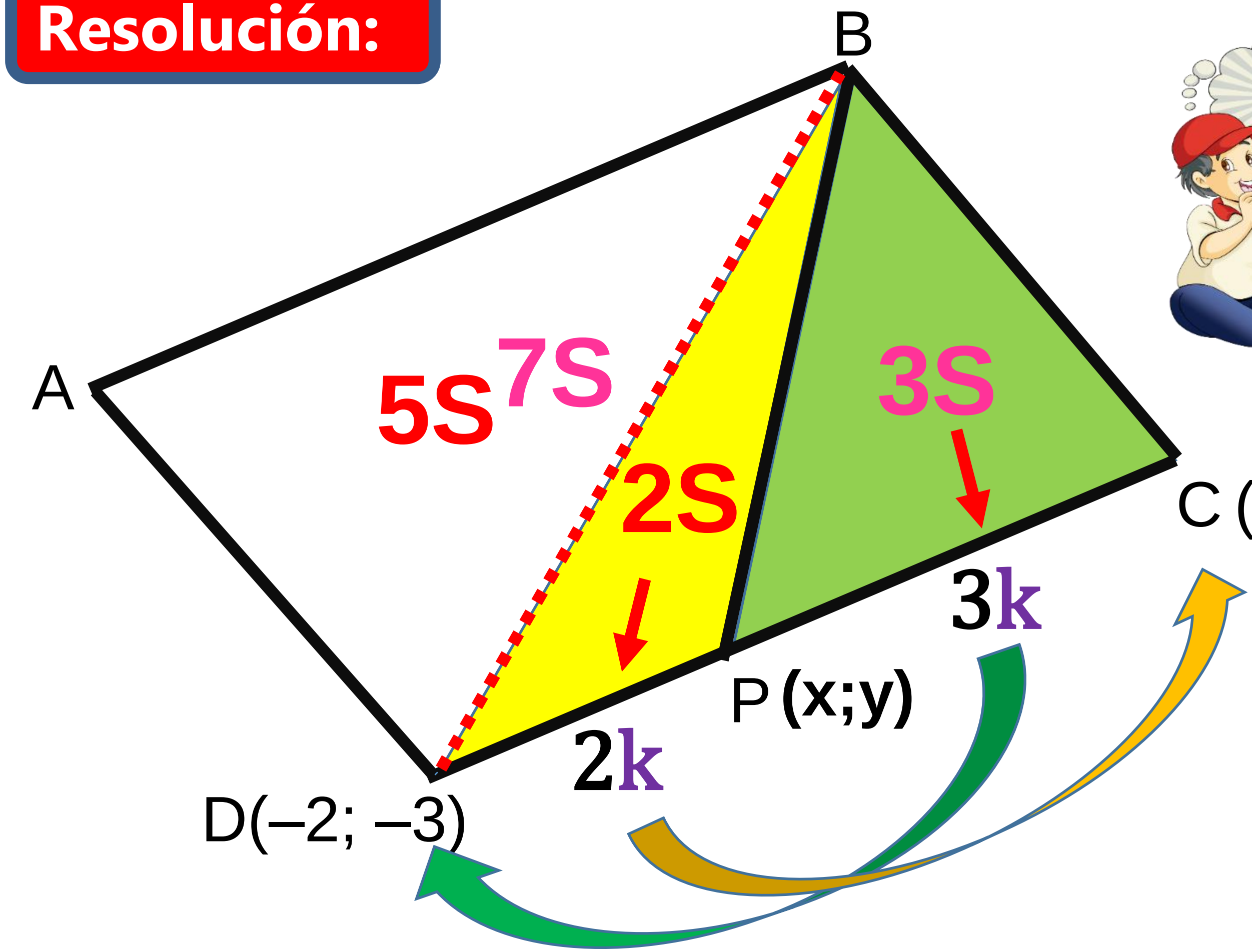
Se observa: $x = AO + OB$ ➡ $AB = 2csc\theta + 2$

$$\therefore \boxed{AB = 2(csc\theta + 1)}$$

HELICO-PRACTICE 4

Sabiendo que ABCD es un paralelogramo, calcule la suma de coordenadas del punto P. (S es área).

Resolución:



Sabemos:

$$x = \frac{2k(8)+3k(-2)}{2k+3k} \Rightarrow x = 2$$

$$y = \frac{2k(7)+3k(-3)}{2k+3k} \Rightarrow y = 1$$

$$\therefore \boxed{x + y = 3}$$

HELICO-PRACTICE 5

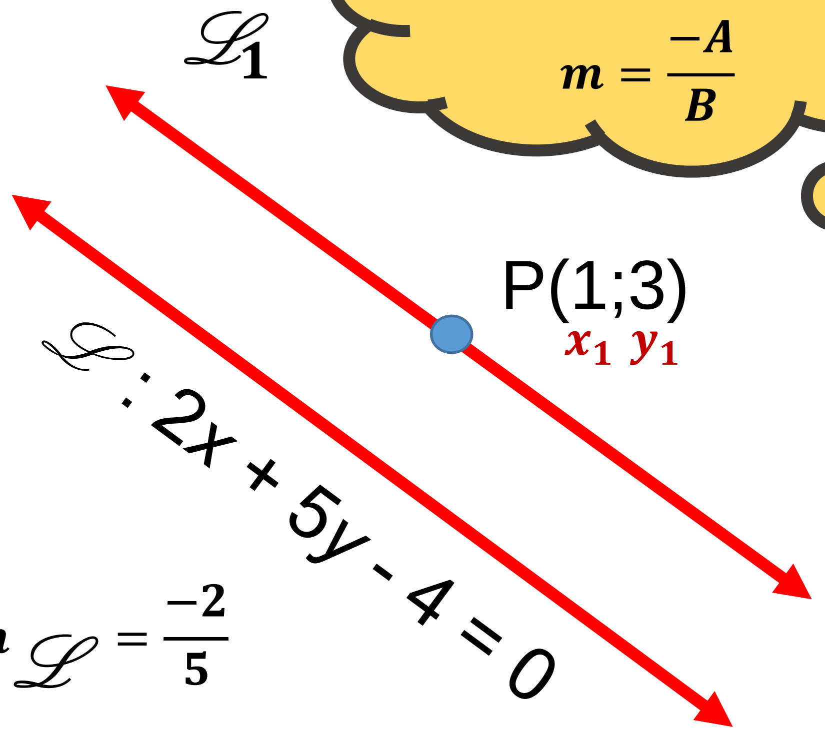
Halle la ecuación de la recta que pasa por el punto P(1;3) y es paralela a la recta $\mathscr{L}$: 2x + 5y - 4 = 0.

Resolución:

$$\boxed{Ax + By + C = 0}$$

$$m = \frac{-A}{B}$$

$\mathscr{L}_1$



$$m_{\mathscr{L}} = \frac{-2}{5}$$

Como $\mathscr{L}_1 \,//\, \mathscr{L}$ $\Rightarrow$ $\boxed{m_{\mathscr{L}_1} = m_{\mathscr{L}}}$

$\Rightarrow$ $m_{\mathscr{L}_1} = -\frac{2}{5}$

Calculando la ecuación de $\mathscr{L}_1$

$$\boxed{y - y_1 = m_{\mathscr{L}_1}(x - x_1)}$$

$\Rightarrow$ $y - 3 = -\frac{2}{5}(x - 1)$

$\therefore$ $\boxed{2x + 5y - 17 = 0}$

HELICO-PRACTICE 6

Si $sen^2\alpha = \dfrac{225}{289}$ y $\alpha \in$ IIC, efectúe $Q = sec\alpha + tan\alpha$

Resolución:

Del dato:

$$sen^2\alpha = \frac{225}{289}$$

$$sen\alpha = \frac{15}{17}$$

$$sen\alpha = \frac{15}{17} = \frac{y}{r}$$

Sabemos:

$$r = \sqrt{x^2 + y^2}$$

$$17 = \sqrt{x^2 + 15^2}$$

$$289 = x^2 + 225$$

$$64 = x^2$$

$$\pm 8 = x$$

$$Como\ \alpha \in IIC \Rightarrow x = -8$$

Piden:

$$Q = sec\alpha + tan\alpha$$

$$Q = \frac{r}{x} + \frac{y}{x}$$

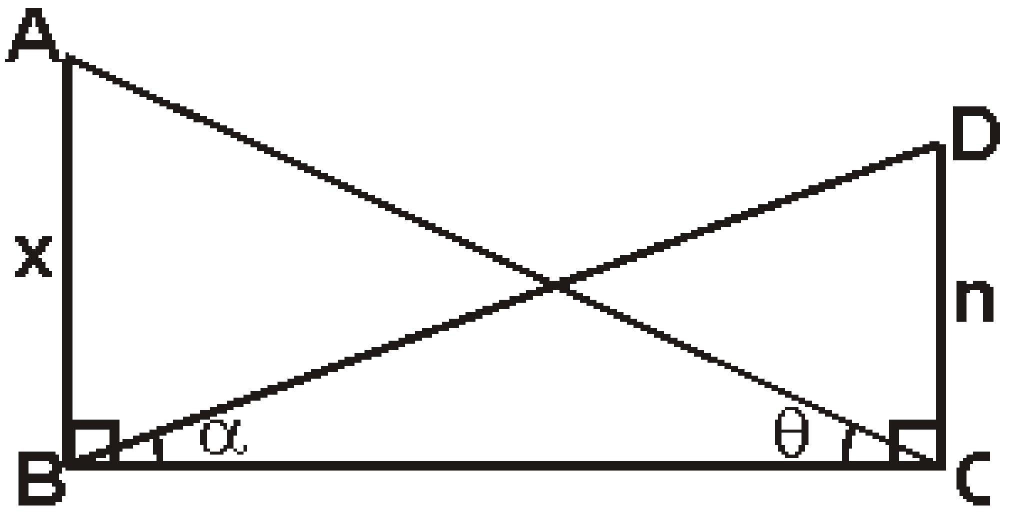
$$Q = \frac{17}{-8} + \frac{15}{-8}$$

$$Q = \frac{32}{-8}$$

$$\therefore \boxed{Q = -4}$$

HELICO-PRACTICE 7

Del gráfico, calcule x en términos de n, α y θ



Resolución:

Recordando:

$$RT(\alpha) = \frac{LO\ QUE\ QUIERO}{LO\ QUE\ TENGO}$$

⊿BCD:

$$\frac{BC}{n} = \cot\alpha \Rightarrow BC = n\cot\alpha$$

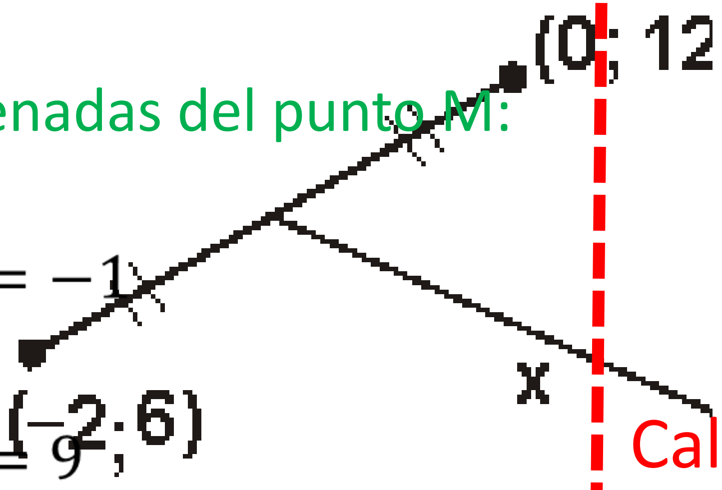
⊿ABC:

$$\frac{AB}{BC} = \tan\theta \Rightarrow \boxed{x} = (BC)\tan\theta$$

$$\therefore \boxed{x = n.\cot\alpha.\tan\theta}$$

HELICO-PRACTICE 8

Del gráfico, calcule el valor de x



Resolución:

Calculamos las coordenadas del punto M:

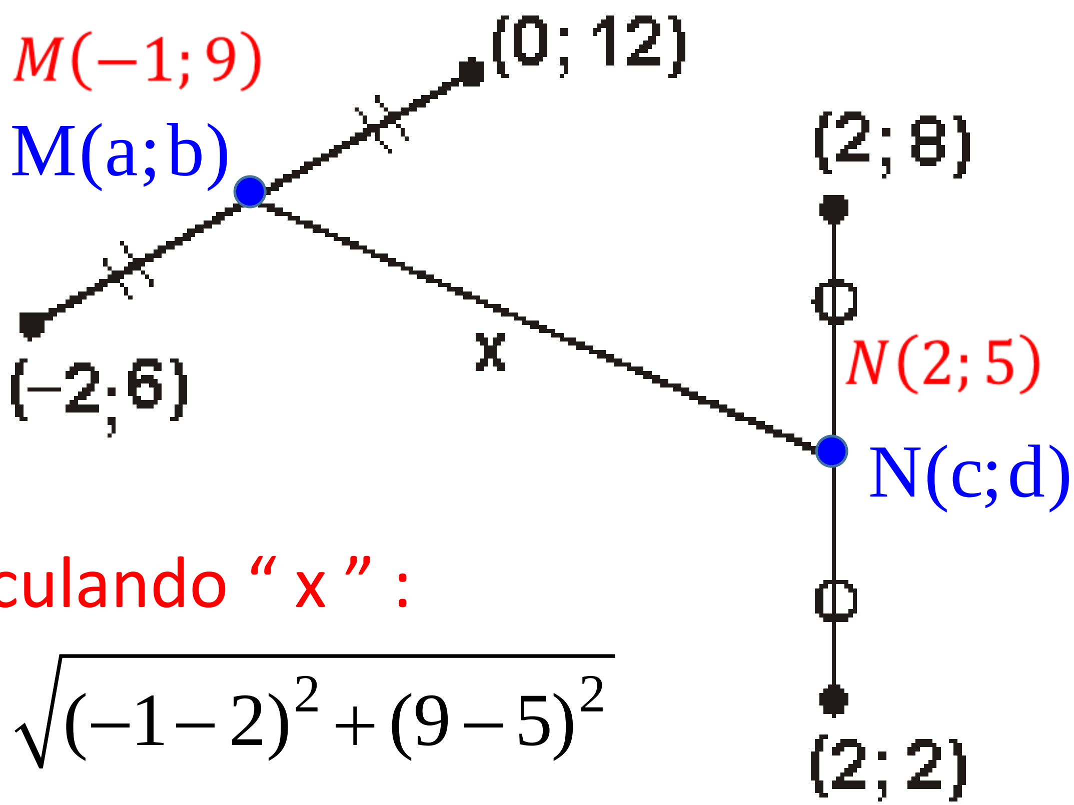
$$a = \frac{-2+0}{2} \Rightarrow a = -1$$

$$b = \frac{6+12}{2} \Rightarrow b = 9$$

Calculamos las coordenadas del punto N:

$$c = \frac{2+2}{2} \Rightarrow c = 2$$

$$d = \frac{8+2}{2} \Rightarrow d = 5$$



Calculando " x " :

$$x = \sqrt{(-1-2)^2+(9-5)^2}$$

$$x = \sqrt{(-3)^2+(4)^2} = \sqrt{25}$$

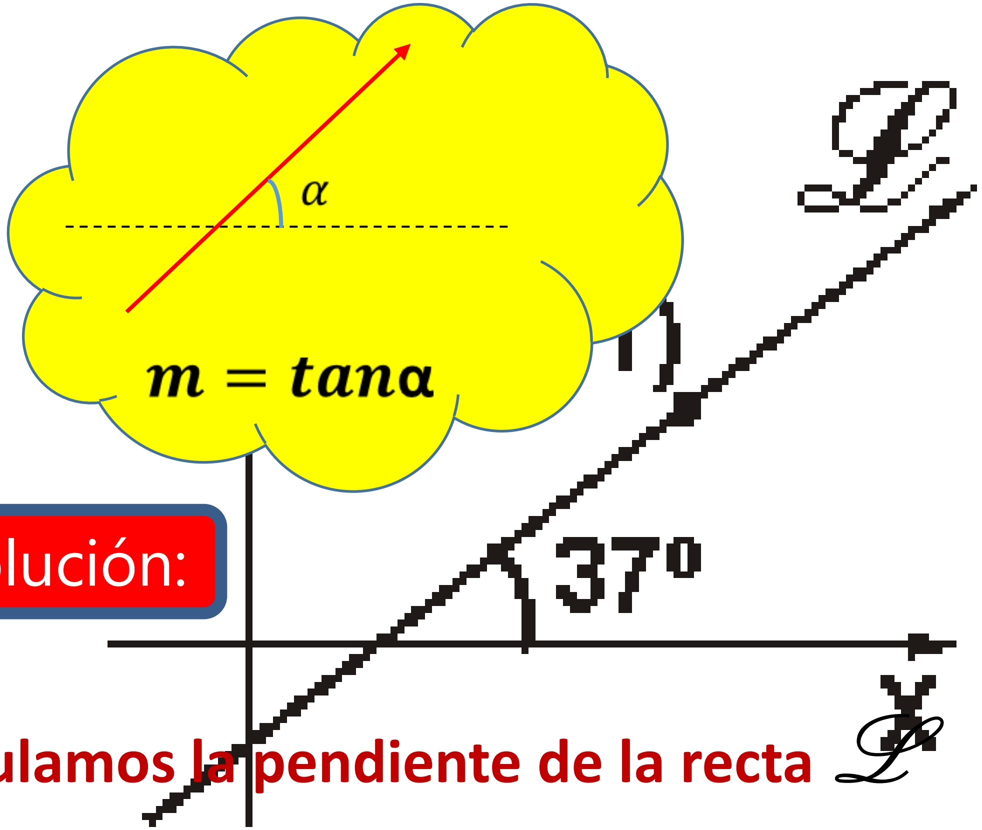
(2;2)

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

HELICO-PRACTICE 9

Calcule la ecuación de la recta $\mathscr{L}$

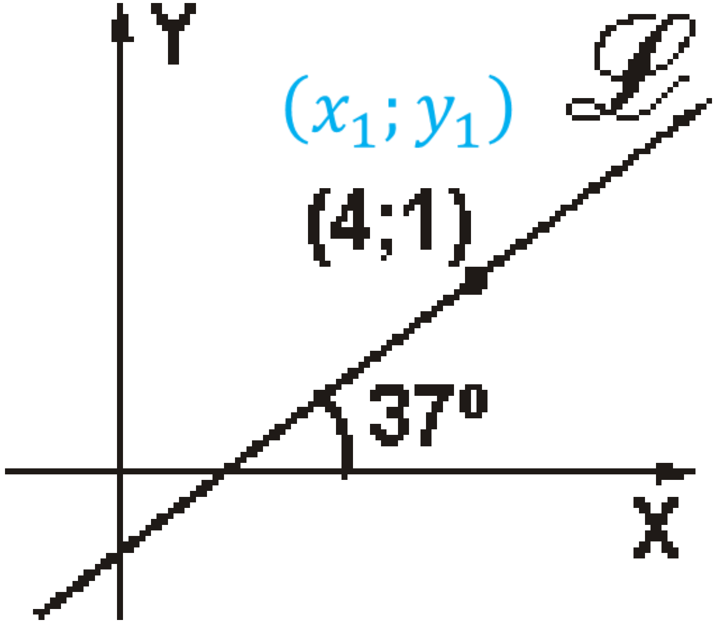
Recordemos:



Resolución:

Calculamos la pendiente de la recta $\mathscr{L}$

$m = tan37^0$ ➡ $m = \dfrac{3}{4}$



Calculamos la ecuación de la recta $\mathscr{L}$

$$\boxed{y - y_1 = m\,(x - x_1)}$$

$$y - 1 = \frac{3}{4}(x - 4)$$

$$\therefore \boxed{3x - 4y - 8 = 0}$$

HELICO-PRACTICE 10

Del grafico mostrado, calcule cotθ

Resolución:

$$cot\theta = \frac{x}{y} = \frac{-7}{4}$$

$$\therefore \boxed{\cot\theta = -\frac{7}{4}}$$