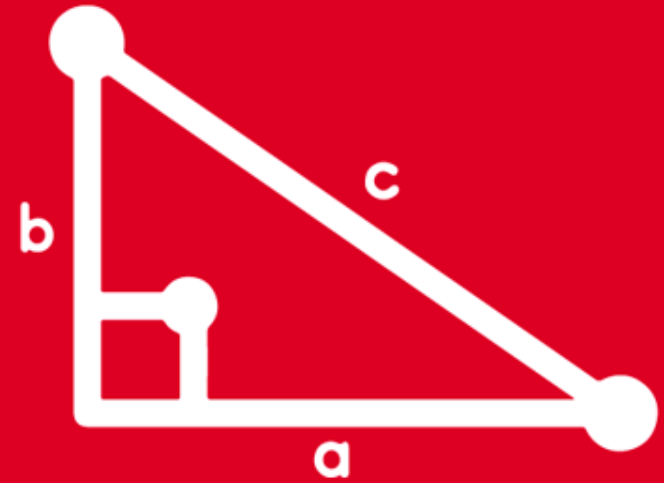




# TRIGONOMETRY

3th  
SECONDARY

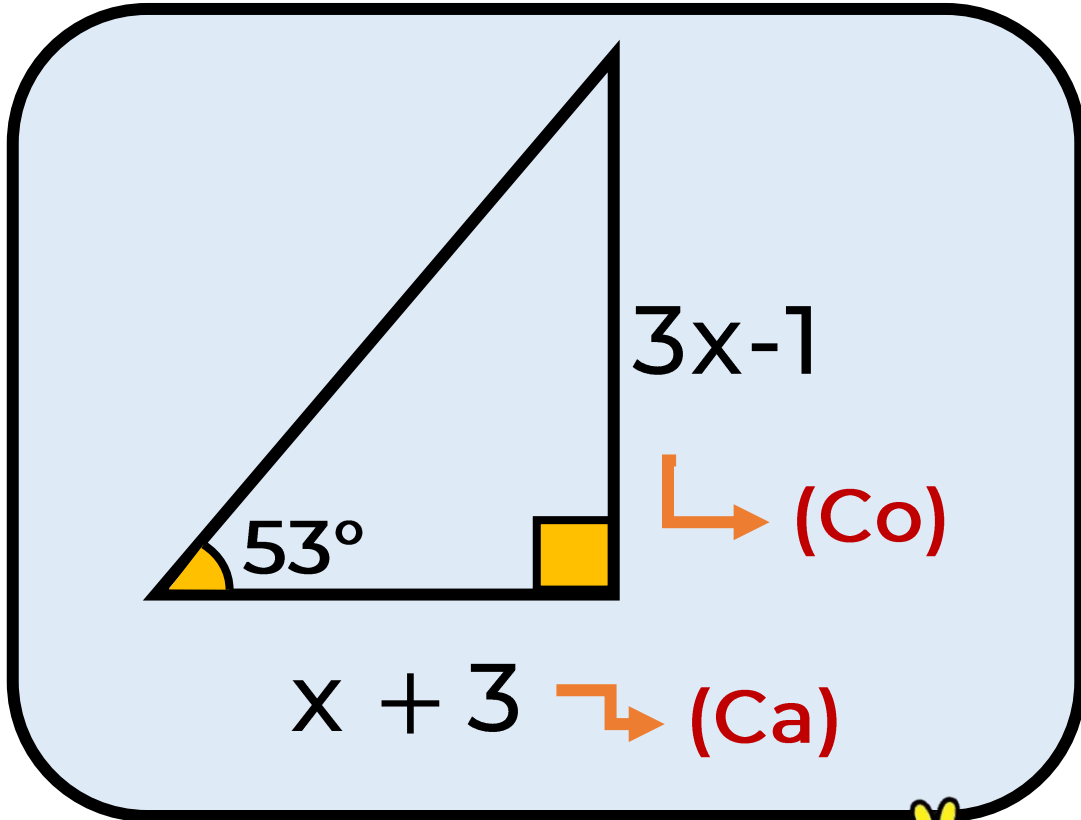
FEEDBACK



TRABAJA DURO EN  
SILENCIO Y TU ÉXITO HARÁ  
TODO EL RUIDO.

“frases

# 1. Del gráfico, calcule x.



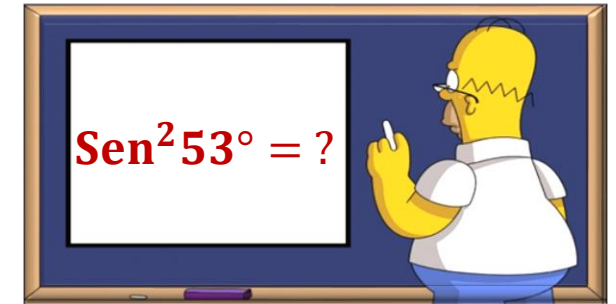
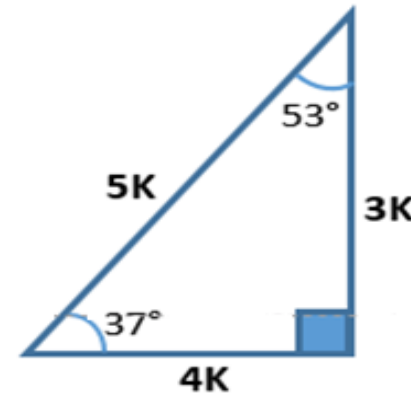
Recordar

$$\tan(\theta) = \frac{\text{CO}}{\text{CA}}$$



## Resolución

❖ Se observa el  $\Delta$  es conocido.



PIDEN

$$\tan 53^\circ = \frac{3x-1}{x+3}$$

$$\frac{4}{3} = \frac{3x-1}{x+3}$$

$$4(x+3) = 3(3x-1)$$

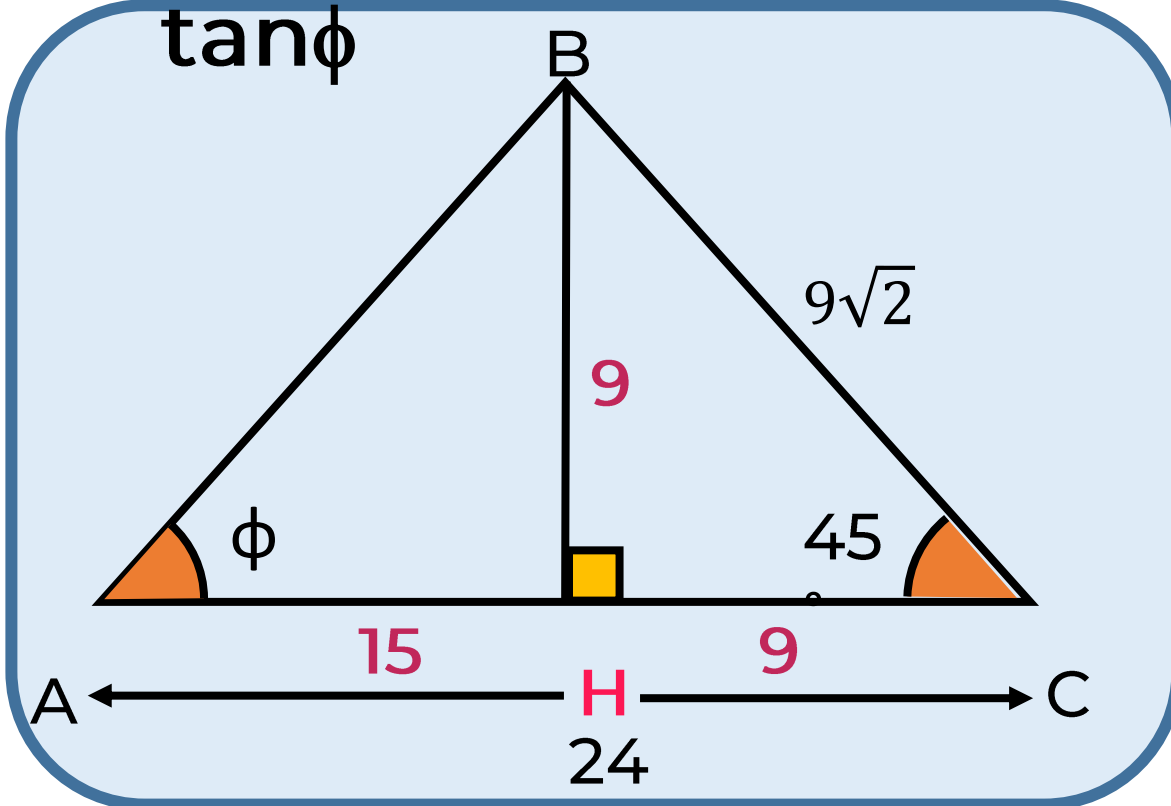
$$4x + 12 = 9x - 3$$

$$15 = 5x$$

$$\therefore x = 3$$

## 2. Del gráfico, calcule

$\tan \phi$

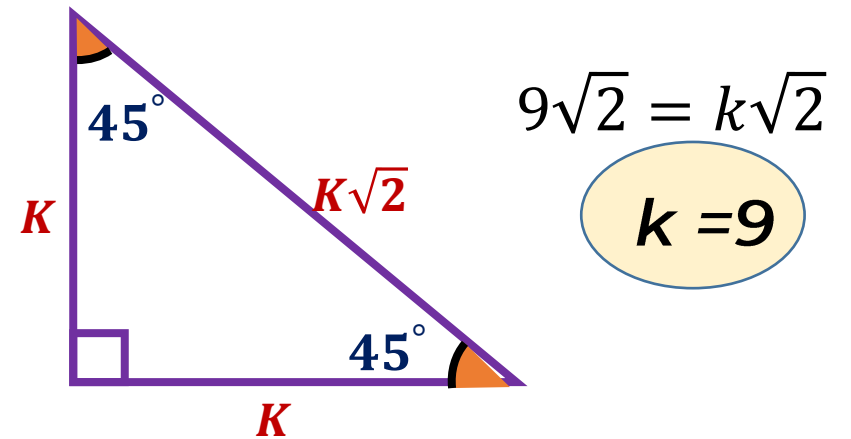


Recordar:

$$\tan(\theta) = \frac{CO}{CA}$$

### RESOLUCIÓN:

- ❖ Trazaremos una altura (BH)
- ❖ Se observa el  $\triangle BHC$  es notable

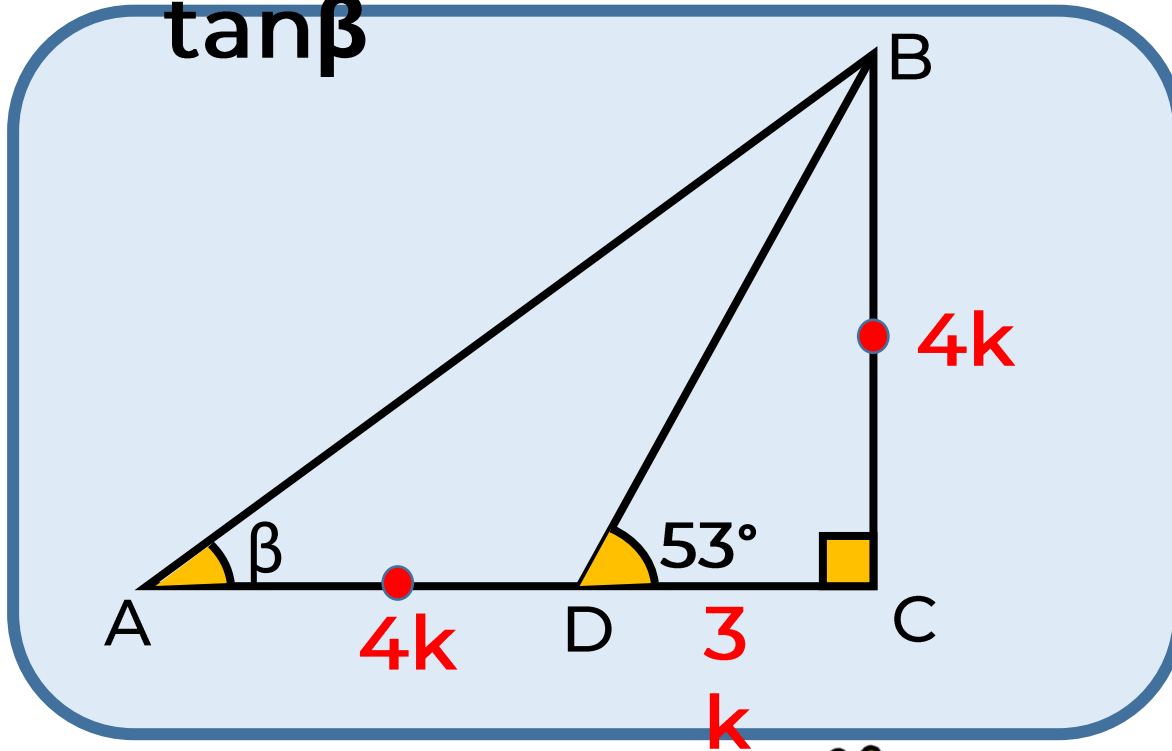


PIDEN:  $\tan \phi = \frac{9}{15}$

$$\therefore \tan \phi = \frac{3}{5}$$



### 3. Del gráfico, calcule $\tan\beta$



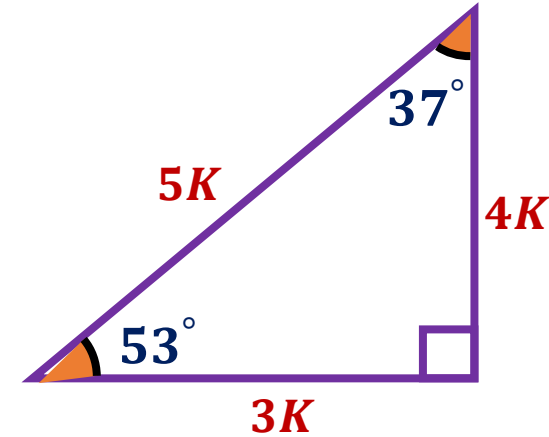
Recordar:

$$\text{sen}(\theta) = \frac{\text{CO}}{\text{H}}$$



### RESOLUCIÓN

❖ Se observa el  $\triangle BCD$  es notable



PIDEN:

$$\tan\beta = \frac{4k}{7k}$$

$$\therefore \tan\beta = \frac{4}{7}$$





4. Para un ángulo agudo  $\theta$ , se tiene que:

$$\tan\theta = \frac{2\sin 20^\circ + 3\cos 70^\circ}{3\cos 70^\circ - \sin 20^\circ}$$

Efectúe:

$$P = \sec\theta \cdot \csc\theta$$

Recordar:

$$\begin{aligned} \text{Si: } \alpha + \beta &= 90^\circ & \sec(\theta) &= \frac{H}{CA} \\ \sin\alpha &= \cos\beta & \csc(\theta) &= \frac{H}{CO} \end{aligned}$$



RESOLUCIÓN:

$$\tan\theta =$$

$$\frac{2\cos 70^\circ + 3\cos 70^\circ}{3\cos 70^\circ - \sin 20^\circ}$$

$$\frac{5\cos 70^\circ}{5\cos 70^\circ - \sin 20^\circ} = \frac{5}{2} \rightarrow \begin{matrix} \text{CO} \\ \text{CA} \end{matrix}$$

❖ Utilizando el teorema de pitagoras :  $H = \sqrt{29}$

PIDEN:  $P = \frac{\sqrt{29}}{2} \cdot \frac{\sqrt{29}}{5} = \frac{29}{10}$

$$\therefore P = \frac{29}{10}$$



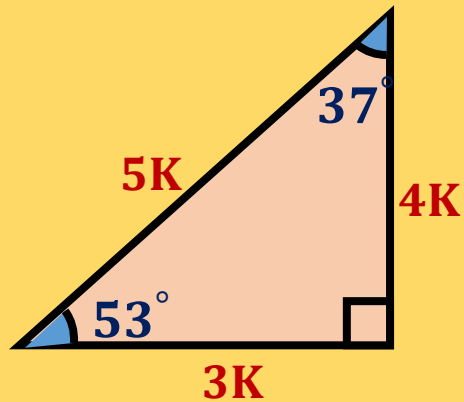
5. Calcule el valor de  $\tan(73^\circ - x)$

$$\cos(2x + 20^\circ) = \sin(4x - 50^\circ)$$

Recordar:

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

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



RESOLUCIÓN

Ni:

$$\cos(2x + 20^\circ) = \sin(4x - 50^\circ)$$

$$2x + 20^\circ + 4x - 50^\circ = 90^\circ$$

$$6x - 30^\circ = 90^\circ$$

$$6x = 120^\circ \quad \Rightarrow \quad x = 20^\circ$$

PIDEN:

$$\tan(73^\circ - 20^\circ) \quad \tan(53^\circ) = \frac{4}{3}$$

$$\therefore \tan(53^\circ)$$

$$= \frac{4}{3}$$





6. Para un ángulo agudo  $\beta$  se tiene que:

$$\tan\beta = \frac{6\sin 40^\circ \cdot \sin 30^\circ}{\sqrt{2}\cos 50^\circ \cdot \sec 45^\circ}$$

Efectúe:

$$B = \sqrt{13} \cdot \cos\beta$$

Recordar:

Si:  $\alpha + \beta = 90^\circ$   $\cos(\theta) = \frac{CA}{H}$   
 $\sin\alpha = \cos\beta$



### RESOLUCIÓN:

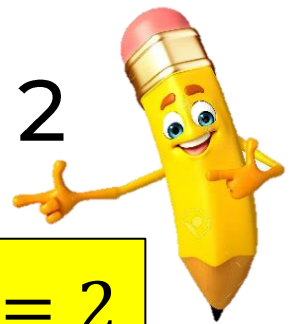
❖ Utilizando la propiedad :  $\cos 50^\circ = \sin 40^\circ$

$$\tan\beta = \frac{6\cancel{\sin 40^\circ} \cdot \left(\frac{1}{2}\right)}{\sqrt{2}\cancel{\sin 40^\circ} \cdot \sqrt{2}} = \frac{3}{2} \rightarrow \begin{matrix} \text{CO} \\ \text{CA} \end{matrix}$$

❖ Utilizando el teorema de pitagoras :  $H = \sqrt{13}$

PIDEN:  $B = \sqrt{13} \cdot \frac{2}{\sqrt{13}} = 2$

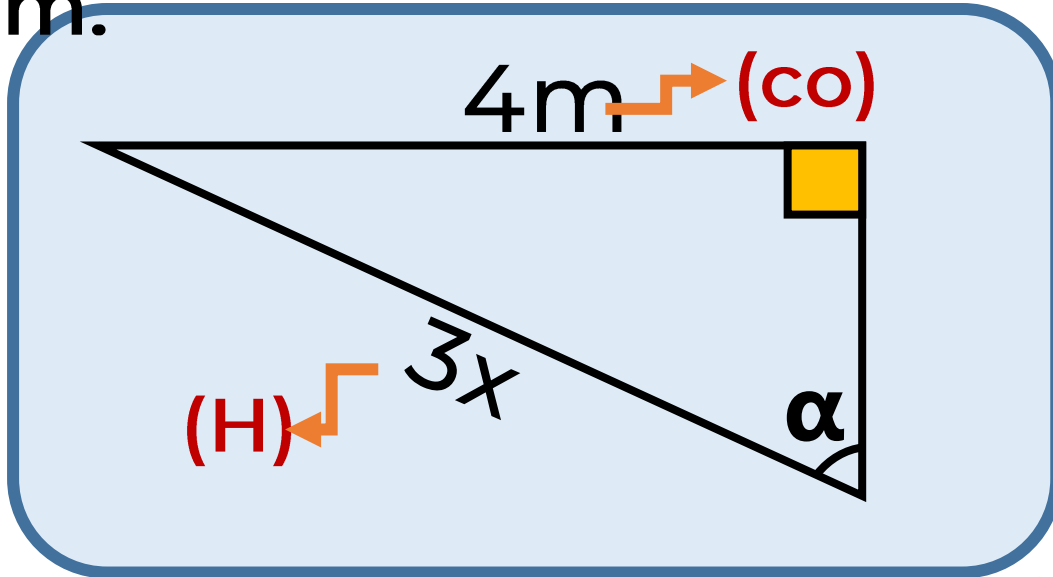
$$\therefore B = 2$$







7. Del gráfico, calcule el valor de  $x$  en términos de  $\alpha$  y  $m$ .



Recordar:

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

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



RESOLUCIÓN:

$$\frac{3x}{4m} = \csc(\alpha)$$

$$3x = 4m \cdot \csc(\alpha)$$

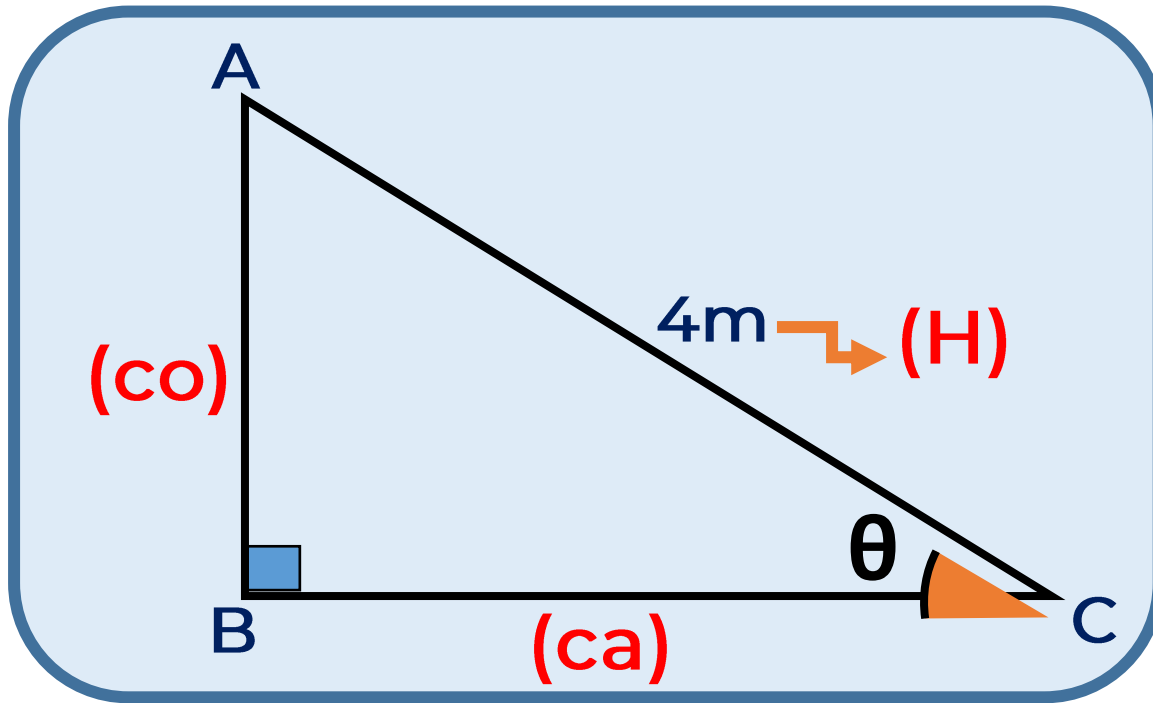
$$\therefore X = \frac{4m \cdot \csc(\alpha)}{3}$$

3





8. Del gráfico, calcule el perímetro del triángulo ABC , en términos de  $\theta$



Recordar:

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

$$\begin{aligned} \text{sen}(\theta) &= \frac{\text{CO}}{\text{H}} \\ \text{cos}(\theta) &= \frac{\text{CA}}{\text{H}} \end{aligned}$$

RESOLUCIÓN:

$$\frac{AB}{4} = \text{sen}\theta \rightarrow AB = 4 \cdot \text{sen}\theta$$

$$\frac{BC}{4} = \text{cos}\theta \rightarrow BC = 4 \cdot \text{cos}\theta$$

PIDEN:

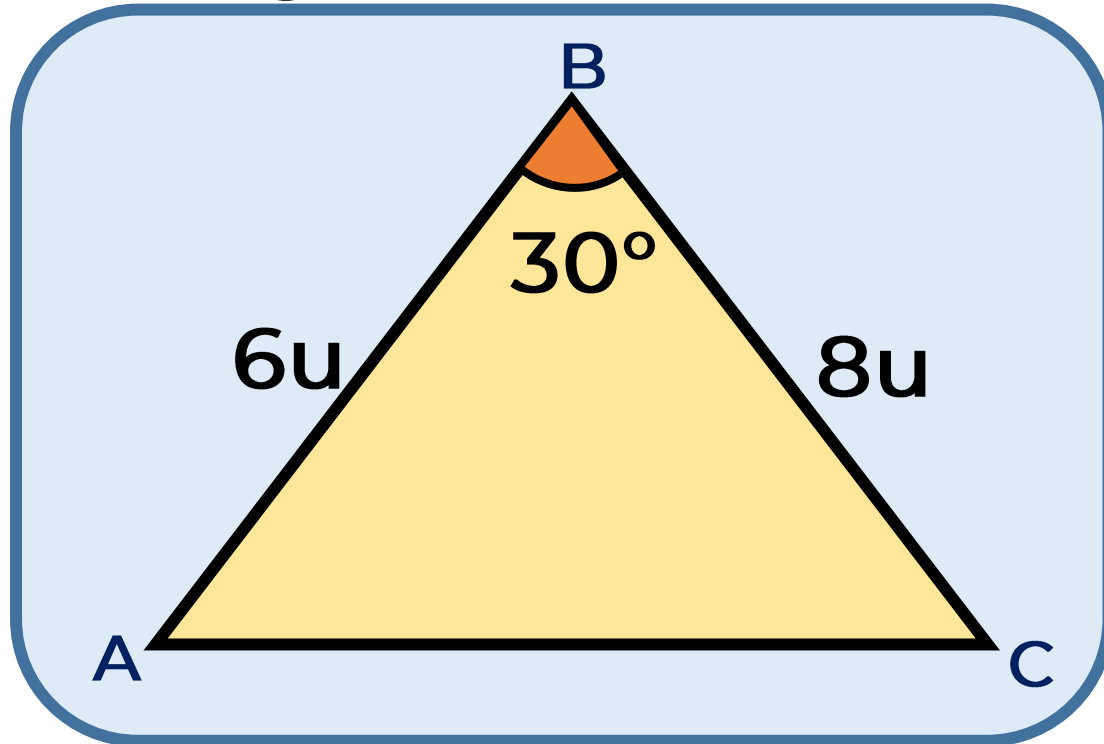
$$2P = AB + BC + AC$$

$$2P = 4 \cdot \text{sen}\theta + 4 \cdot \text{cos}\theta + 4$$

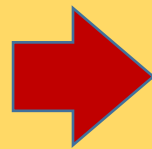
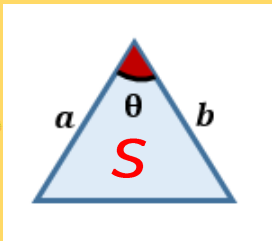
$$\therefore 2P = 4 (\text{sen}\theta + \text{cos}\theta + 1)$$



9. Del gráfico, calcule el área de la región triangular ABC



Recordar:



$$S = \frac{a \cdot b}{2} \cdot \text{Sen } \theta$$

RESOLUCIÓN:

❖ Utilizando la fórmula del área de la región triangular.

$$S = \frac{(6u)(8u)}{2} \cdot \text{sen} 30^\circ$$

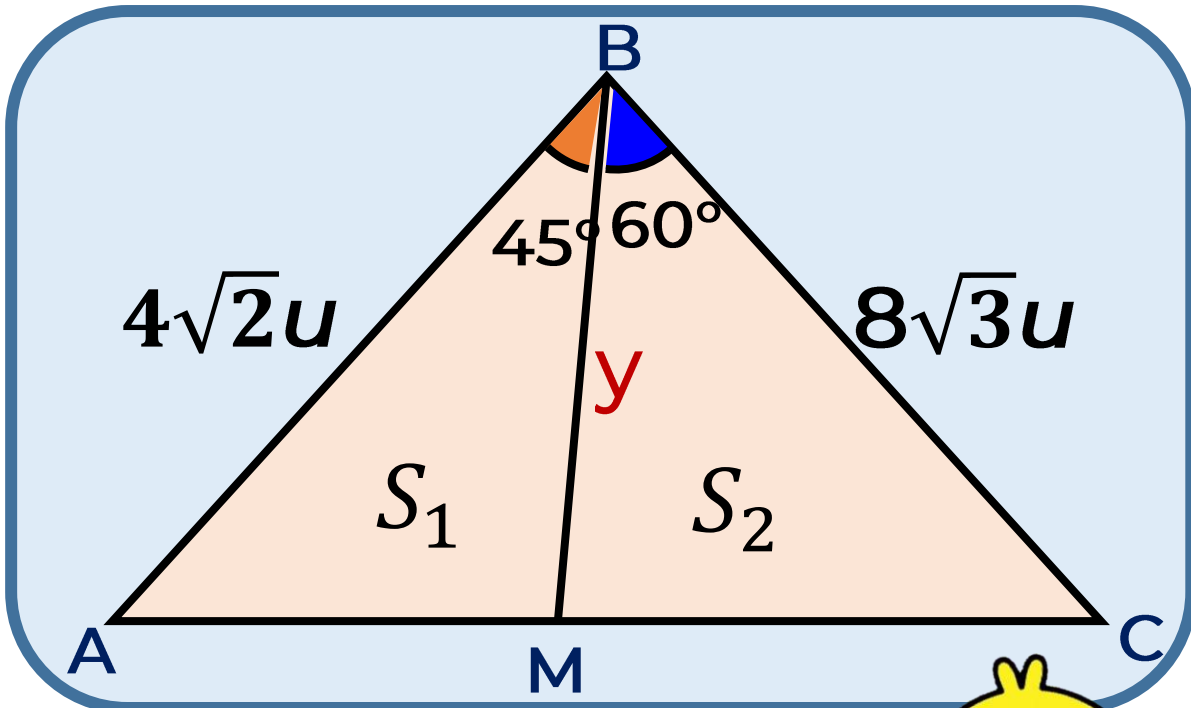
$$S = \frac{(6u)(8u)}{2} \cdot \frac{1}{2}$$

$$\therefore S = 12u^2$$

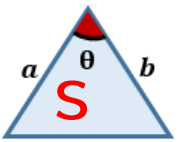




10. Del gráfico, calcule  $\frac{S_1}{S_2}$ , ( $S_1$  ;  $S_2$  son áreas)



Recordar:



$$S = \frac{a \cdot b}{2} \cdot \text{sen} \theta$$



RESOLUCIÓN:

❖  $BM = y$

$$S_1 = \frac{4\sqrt{2} \cdot y}{2} \cdot \text{Sen} 45^\circ \Rightarrow 2\sqrt{2} \cdot y \cdot \frac{\sqrt{2}}{2} = 2y$$

$$S_2 = \frac{8\sqrt{3} \cdot y}{2} \cdot \text{Sen} 60^\circ \Rightarrow 4\sqrt{3} \cdot y \cdot \frac{\sqrt{3}}{2} = 6y$$

PIDEN:  $\frac{S_1}{S_2} = \frac{2y}{6y} = \frac{1}{3}$

$$\therefore \frac{S_1}{S_2} = \frac{1}{3}$$



Gracias  
totales

