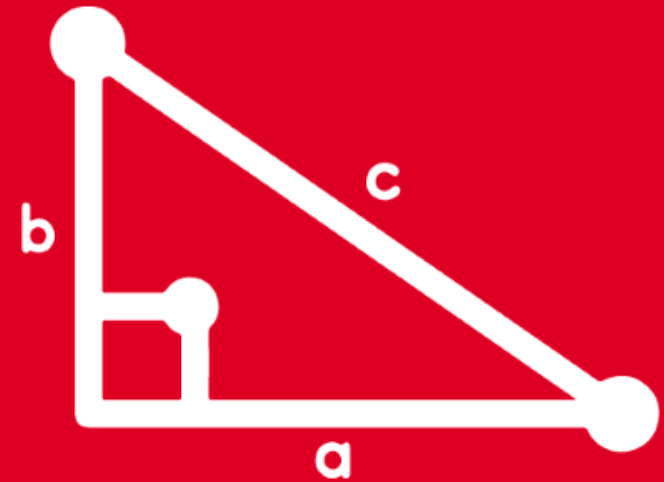


# TRIGONOMETRY

## Chapter 06

**2nd**  
SECONDARY

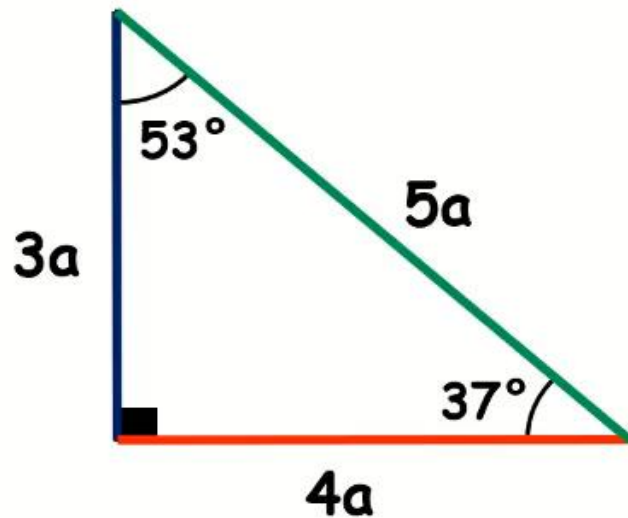
**RAZONES TRIGONOMÉTRICAS**  
**DE ÁNGULOS NOTABLES DE**  
**37° Y 53°**



**SACO OLIVEROS**

# Triángulos Rectángulos Notables

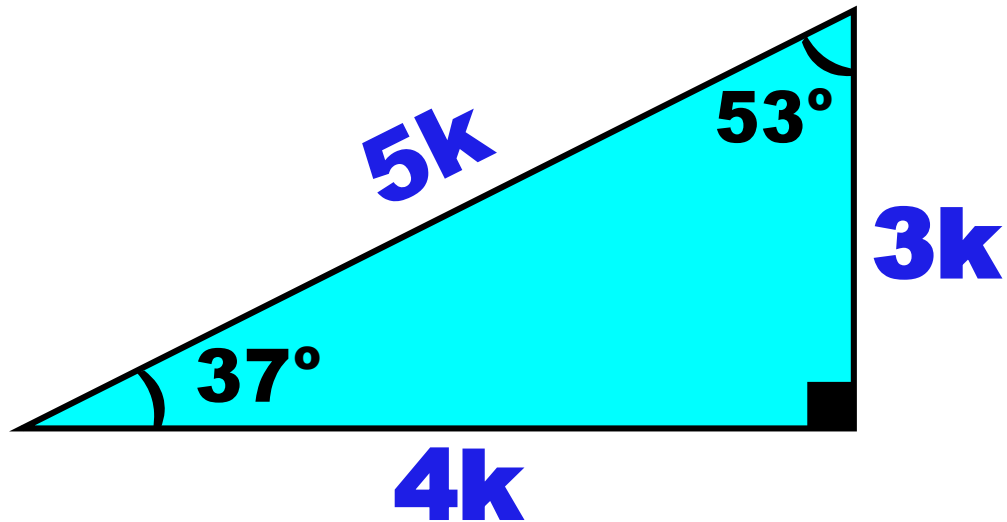
De  $37^\circ$  y  $53^\circ$  (Aproximado)





# RAZONES TRIGONOMÉTRICAS DE ÁNGULOS NOTABLES DE $37^\circ$ Y $53^\circ$

Recordemos el  $\triangle$  notable de  $37^\circ$  y  $53^\circ$  para el cálculo de sus R.T



Además :

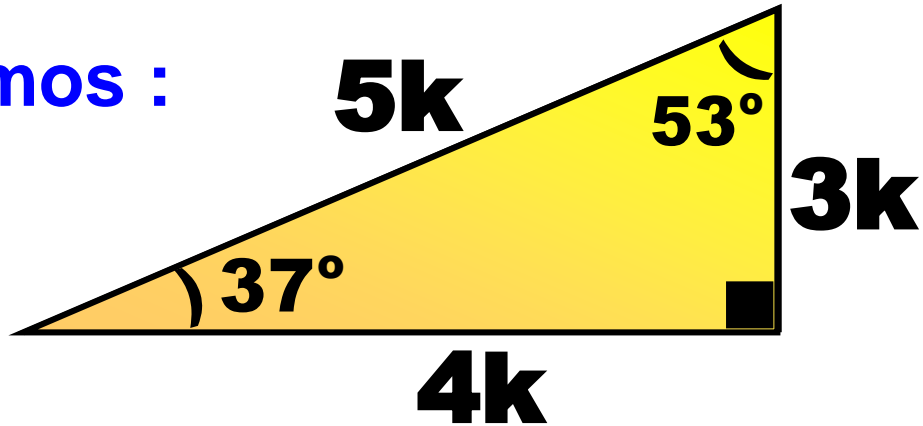
sen	cos	tan	cot	sec	csc
$\frac{CO}{H}$	$\frac{CA}{H}$	$\frac{CO}{CA}$	$\frac{CA}{CO}$	$\frac{H}{CA}$	$\frac{H}{CO}$

MÉTODO NEMOTÉCNICO :

“ COCA COCA HELADA HELADA ”



**Veamos :**



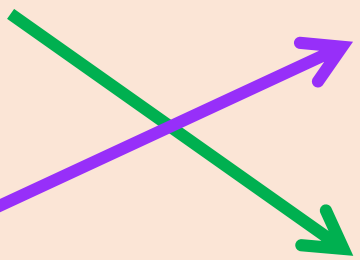
$$\begin{aligned} \sin 37^\circ &= \frac{CO}{H} = \frac{3k}{5k} \rightarrow \sin 37^\circ = \frac{3}{5} \\ \cos 37^\circ &= \frac{CA}{H} = \frac{4k}{5k} \rightarrow \cos 37^\circ = \frac{4}{5} \\ \tan 37^\circ &= \frac{CO}{CA} = \frac{3k}{4k} \rightarrow \tan 37^\circ = \frac{3}{4} \end{aligned}$$

**Resumiendo :**


<b>RT</b> 	<b>37°</b>	<b>53°</b>
<b>sen</b>	$\frac{3}{5}$	$\frac{4}{5}$
<b>cos</b>	$\frac{4}{5}$	$\frac{3}{5}$
<b>tan</b>	$\frac{3}{4}$	$\frac{4}{3}$
<b>cot</b>	$\frac{4}{3}$	$\frac{3}{4}$
<b>sec</b>	$\frac{5}{4}$	$\frac{5}{3}$
<b>csc</b>	$\frac{5}{3}$	$\frac{5}{4}$

# HELICO PRACTICE 1

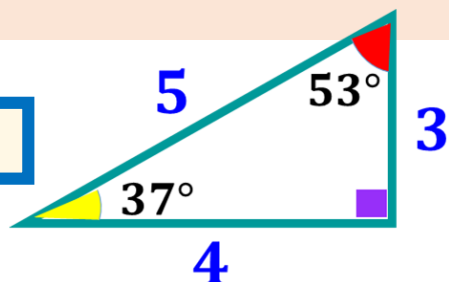
Relacionar las columnas :

I.  $\cos^2 53^\circ$   a.  $\frac{5}{4}$

II.  $\frac{\csc 37^\circ}{\tan 53^\circ}$   b.  $\frac{9}{25}$

III.  $\sqrt{\cot 53^\circ}$   c.  $\frac{\sqrt{3}}{2}$

**Recordar :**



sen $\alpha$	cos $\alpha$	tan $\alpha$	cot $\alpha$	sec $\alpha$	csc $\alpha$
$\frac{CO}{H}$	$\frac{CA}{H}$	$\frac{CO}{CA}$	$\frac{CA}{CO}$	$\frac{H}{CA}$	$\frac{H}{CO}$

## RESOLUCIÓN

I.  $\cos^2 53^\circ = \left(\frac{3}{5}\right)^2 = \frac{9}{25}$

II.  $\frac{\csc 37^\circ}{\tan 53^\circ} = \frac{\frac{5}{3}}{\frac{4}{3}} = \frac{5(3)}{3(4)} = \frac{5}{4}$

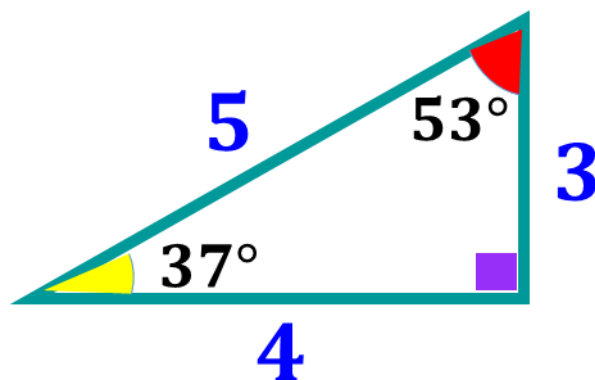
III.  $\sqrt{\cot 53^\circ} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \frac{\sqrt{3}}{2}$

**$\therefore$  Ib ; IIa ; IIIc**

# HELICO PRACTICE 2

Calcule  $M = \frac{\tan 53^\circ + \tan 37^\circ}{\csc 53^\circ}$

Recordar :



$\text{sen}\alpha$	$\text{cos}\alpha$	$\text{tan}\alpha$	$\text{cot}\alpha$	$\text{sec}\alpha$	$\text{csc}\alpha$
$\frac{\text{CO}}{\text{H}}$	$\frac{\text{CA}}{\text{H}}$	$\frac{\text{CO}}{\text{CA}}$	$\frac{\text{CA}}{\text{CO}}$	$\frac{\text{H}}{\text{CA}}$	$\frac{\text{H}}{\text{CO}}$

## RESOLUCIÓN

$$M = \frac{\tan 53^\circ + \tan 37^\circ}{\csc 53^\circ}$$

$$M = \frac{\frac{4}{3} + \frac{3}{4}}{\frac{5}{4}} = \frac{\frac{16 + 9}{12}}{\frac{5}{4}} = \frac{\frac{25}{12}}{\frac{5}{4}}$$

$$M = \frac{25(\cancel{4})}{\cancel{12}(\cancel{5})}$$

$\frac{5}{3}$ 
 $\frac{1}{1}$

$$\therefore M = \frac{5}{3}$$

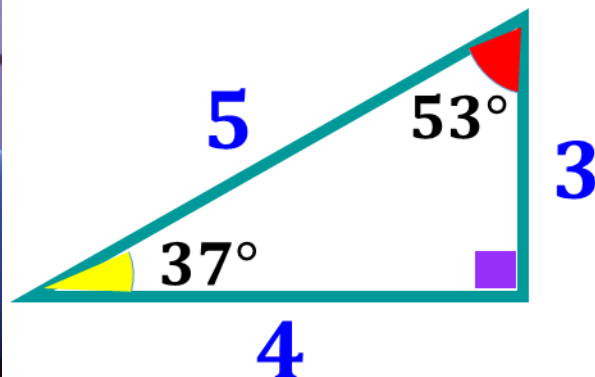
# HELICO PRACTICE 3

Resuelva :

$$x \cdot \sec 37^\circ + \cot 53^\circ = \csc 53^\circ$$



Recordar :



$\text{sen}\alpha$	$\text{cos}\alpha$	$\text{tan}\alpha$	$\text{cot}\alpha$	$\text{sec}\alpha$	$\text{csc}\alpha$
$\frac{\text{CO}}{\text{H}}$	$\frac{\text{CA}}{\text{H}}$	$\frac{\text{CO}}{\text{CA}}$	$\frac{\text{CA}}{\text{CO}}$	$\frac{\text{H}}{\text{CA}}$	$\frac{\text{H}}{\text{CO}}$

**RESOLUCIÓN**

$$x \sec 37^\circ + \cot 53^\circ = \csc 53^\circ$$

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

$$\frac{5x + 3}{4} = \frac{5}{4}$$

$$5x + 3 = 5$$

$$5x = 2$$

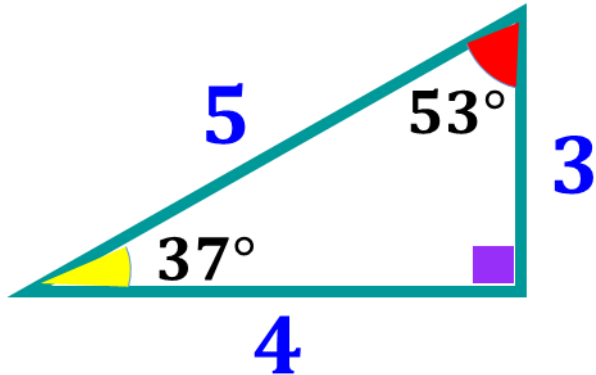
$$\therefore x = \frac{2}{5}$$

# HELICO PRACTICE 4

Resuelva :

$$16^{\tan 37^\circ} = 4^x$$

Recordar :



$\text{sen } \alpha$	$\text{cos } \alpha$	$\text{tan } \alpha$	$\text{cot } \alpha$	$\text{sec } \alpha$	$\text{csc } \alpha$
$\frac{\text{CO}}{\text{H}}$	$\frac{\text{CA}}{\text{H}}$	$\frac{\text{CO}}{\text{CA}}$	$\frac{\text{CA}}{\text{CO}}$	$\frac{\text{H}}{\text{CA}}$	$\frac{\text{H}}{\text{CO}}$

## RESOLUCIÓN

$$16^{\tan 37^\circ} = 4^x$$

$$(4^2)^{\frac{3}{4}} = 4^x$$

$$4^{\frac{(2)(3)}{4}} = 4^x$$

$$\frac{(2)(3)}{4} = x$$

$$\therefore x = \frac{3}{2}$$



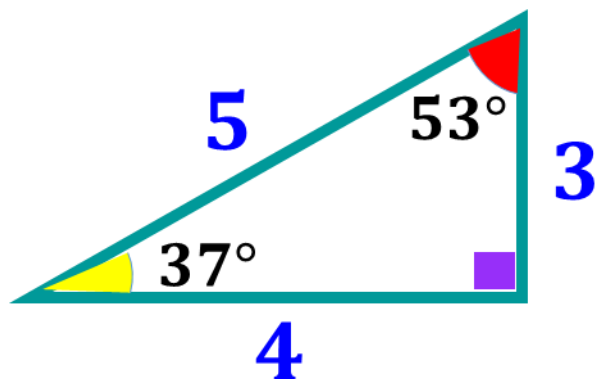


# HELICO PRACTICE 5

Resuelva :

$$\frac{\sin 37^\circ}{\tan 37^\circ} = \frac{x+2}{x}$$

Recordar :



$\sin \alpha$	$\cos \alpha$	$\tan \alpha$	$\cot \alpha$	$\sec \alpha$	$\csc \alpha$
$\frac{CO}{H}$	$\frac{CA}{H}$	$\frac{CO}{CA}$	$\frac{CA}{CO}$	$\frac{H}{CA}$	$\frac{H}{CO}$

RESOLUCIÓN

$$\left[ \begin{array}{l} \frac{3}{5} \\ \frac{3}{4} \end{array} \right] = \frac{x+2}{x}$$

$$\frac{\cancel{3}(4)}{5(\cancel{3})} = \frac{x+2}{x}$$

$$\frac{4}{5} = \frac{x+2}{x}$$

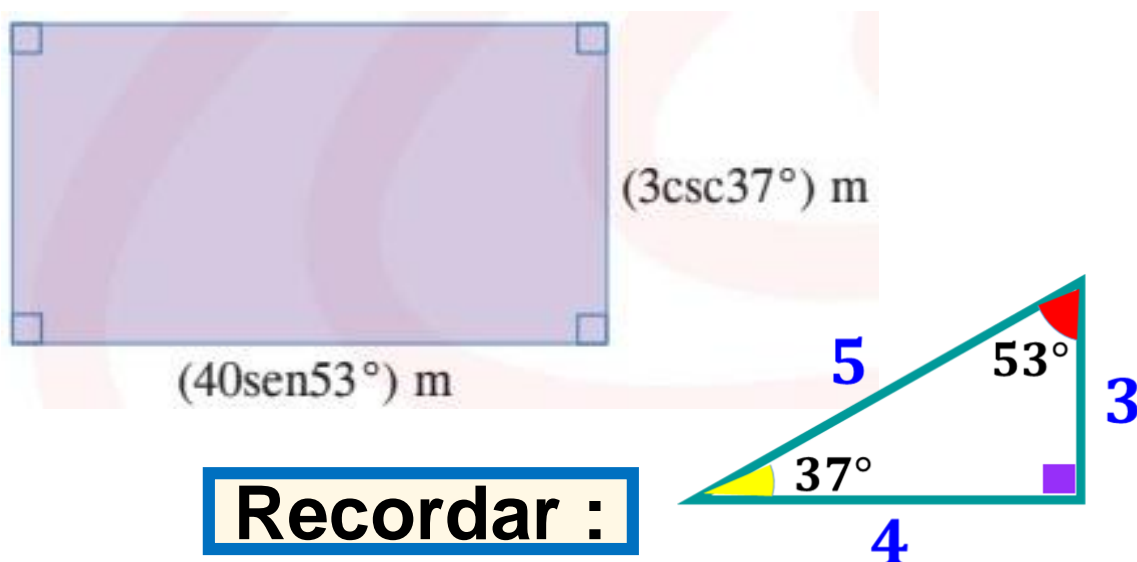
$$4x = 5x + 10$$



$$\therefore x = -10$$

# HELICO PRACTICE 6

Dorian ha comprado un terreno en la urbanización Los Lirios de San Juan de Miraflores, tal como muestra la gráfica. Determine el área del terreno adquirido en metros cuadrados .



**Recordar :**

$\text{sen}\alpha$	$\text{cos}\alpha$	$\text{tan}\alpha$	$\text{cot}\alpha$	$\text{sec}\alpha$	$\text{csc}\alpha$
$\frac{\text{CO}}{\text{H}}$	$\frac{\text{CA}}{\text{H}}$	$\frac{\text{CO}}{\text{CA}}$	$\frac{\text{CA}}{\text{CO}}$	$\frac{\text{H}}{\text{CA}}$	$\frac{\text{H}}{\text{CO}}$

## RESOLUCIÓN

$$A_{\square} = (\text{BASE})(\text{ALTURA})$$

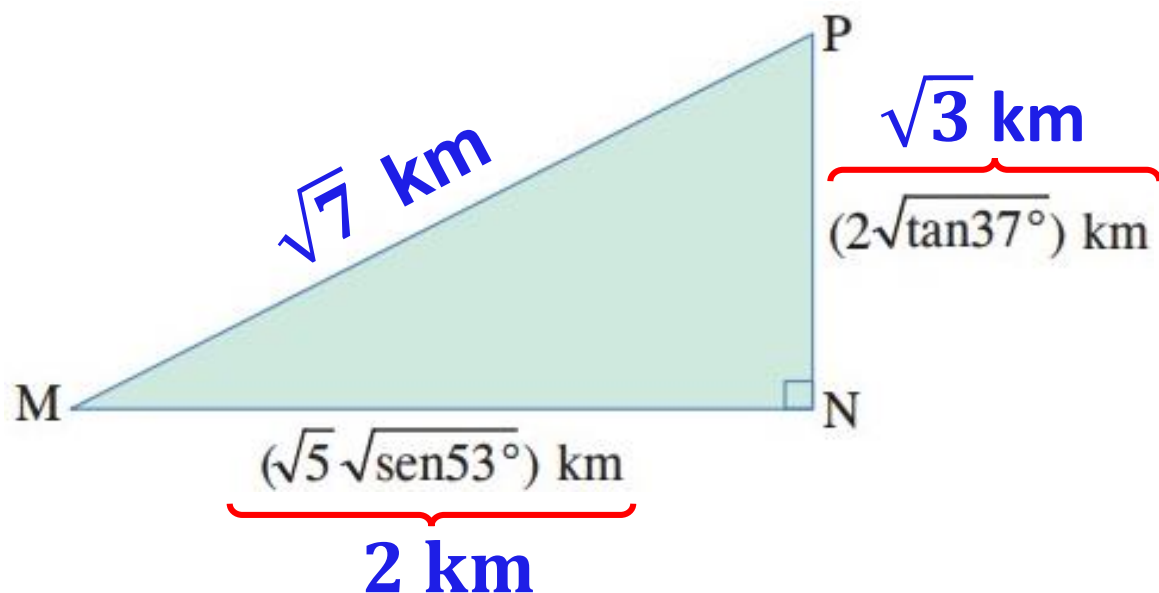
$$A_{\square} = (40 \text{ sen } 53^\circ)(3 \text{ csc } 37^\circ) \text{ m}^2$$

$$A_{\square} = [40 \left( \frac{4}{5} \right)] [3 \left( \frac{5}{3} \right)] \text{ m}^2$$

$$A_{\square} = 32 (5) \text{ m}^2$$

$$\therefore A_{\square} = 160 \text{ m}^2$$

En la figura, se muestra la vista superior de un parque triangular MNP; por medidas de precaución del municipio local ( administrador del parque ), se ha decidido construir un muro a lo largo del lado MP.- Determine la longitud del muro en kilómetros.



## RESOLUCIÓN

$$MN = \sqrt{5} \sqrt{\frac{4}{5}} = \sqrt{5} \cdot \frac{2}{\sqrt{5}} = 2$$

$$PN = 2 \sqrt{\frac{3}{4}} = 2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3}$$

**Teorema de Pitágoras :**

$$(MP)^2 = 2^2 + \sqrt{3}^2$$

$$(MP)^2 = 4 + 3$$

$$\therefore MP = \sqrt{7} \text{ km}$$



**SACO**  
**OLIVEROS**