



TRIGONOMETRY

Chapter 6

2nd
SECONDARY

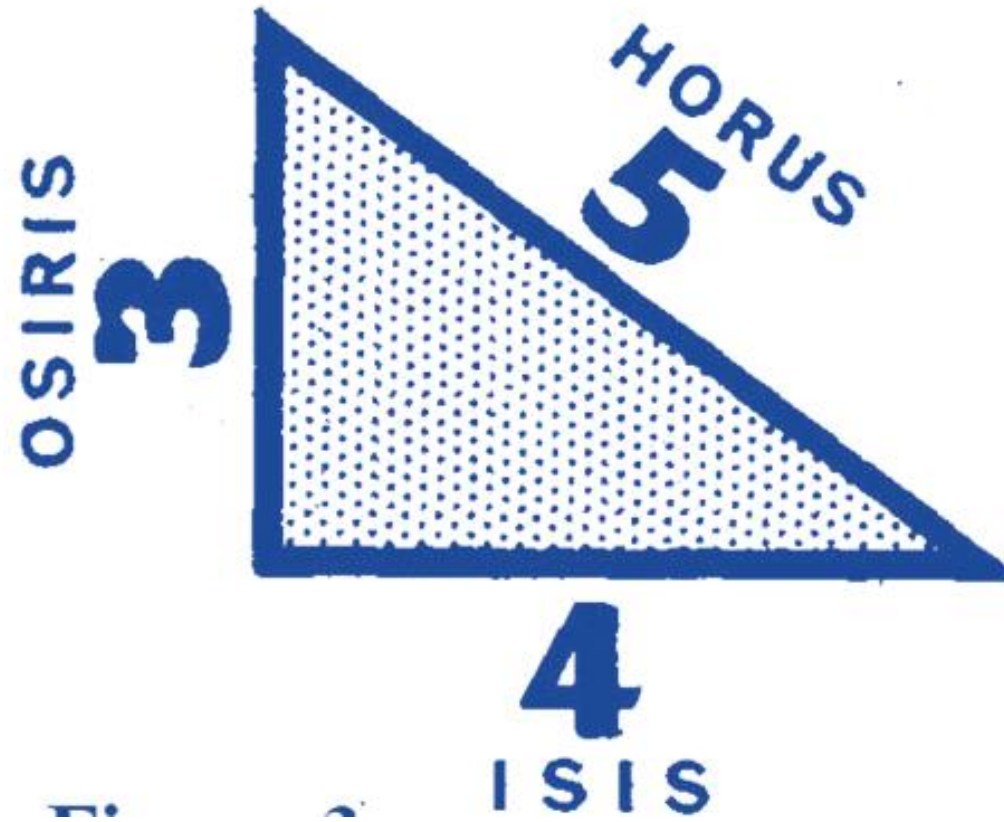
Razones trigonométricas
de los ángulos 37° y 53°



 **SACO OLIVEROS**



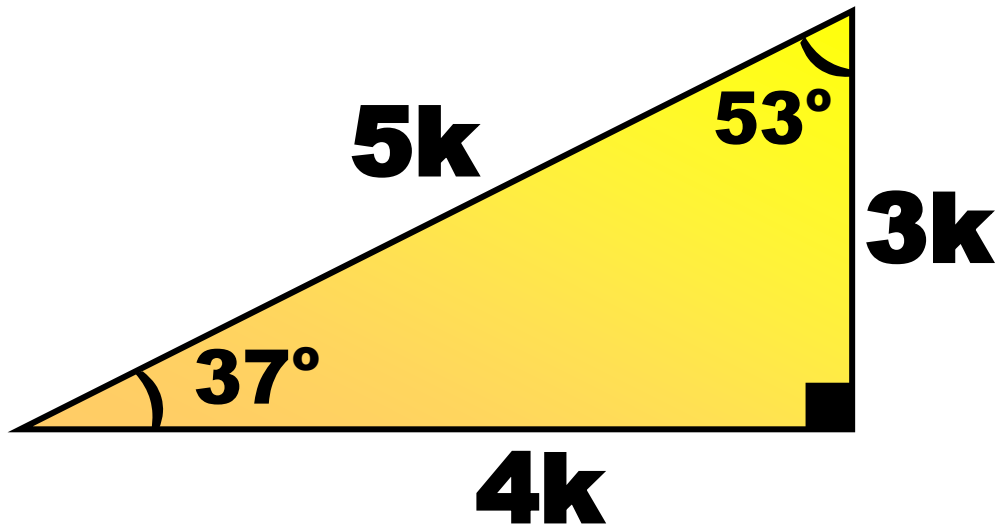
EL TRIÁNGULO EGIPCIO SAGRADO





RAZONES TRIGONOMÉTRICAS DE ÁNGULOS NOTABLES DE 37° Y 53°

Para el cálculo de sus
R.T recordaremos el
▴ de 37° y 53°

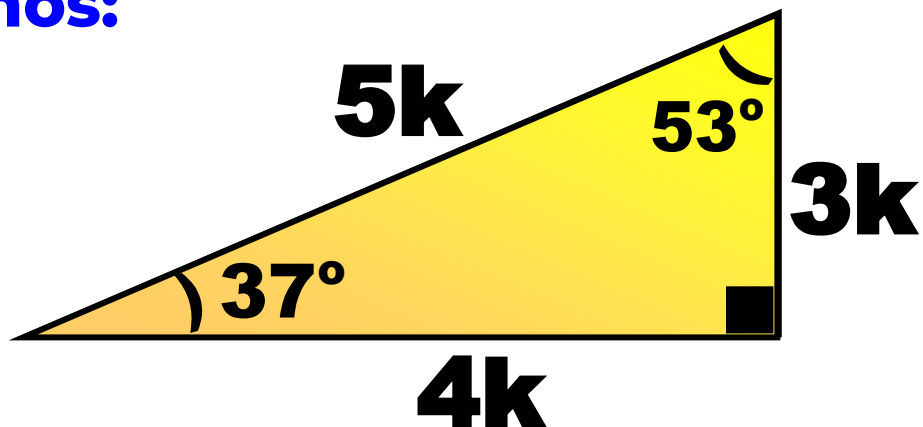


Además:

sen	cos	tan	cot	sec	csc
$\frac{\text{Co}}{\text{H}}$	$\frac{\text{Ca}}{\text{H}}$	$\frac{\text{Co}}{\text{Ca}}$	$\frac{\text{Ca}}{\text{Co}}$	$\frac{\text{H}}{\text{Ca}}$	$\frac{\text{H}}{\text{Co}}$



Veamos:



$$\text{sen}37^\circ = \frac{\text{CO}}{\text{H}} = \frac{3\cancel{k}}{5\cancel{k}} \quad \rightarrow \quad \text{sen}37^\circ = \frac{3}{5}$$

$$\text{cos}37^\circ = \frac{\text{CA}}{\text{H}} = \frac{4\cancel{k}}{5\cancel{k}} \quad \rightarrow \quad \text{cos}37^\circ = \frac{4}{5}$$

$$\text{tan}37^\circ = \frac{\text{CO}}{\text{CA}} = \frac{3\cancel{k}}{4\cancel{k}} \quad \rightarrow \quad \text{tan}37^\circ = \frac{3}{4}$$

Resumiendo:

R.T	37°	53°
sen	$\frac{3}{5}$	$\frac{4}{5}$
cos	$\frac{4}{5}$	$\frac{3}{5}$
tan	$\frac{3}{4}$	$\frac{4}{3}$
cot	$\frac{4}{3}$	$\frac{3}{4}$
sec	$\frac{5}{4}$	$\frac{5}{3}$
csc	$\frac{5}{3}$	$\frac{5}{4}$

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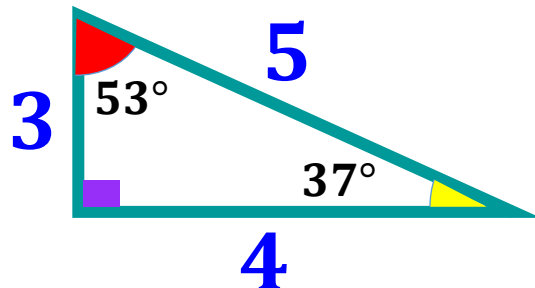
Dadas las columnas:

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

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

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

Recordar:

RESOLUCIÓN

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

$$\text{II. } \frac{\csc 37^\circ}{\tan 53^\circ} = \frac{\frac{5}{3}}{\frac{4}{3}} = \frac{5 \times \cancel{3}}{\cancel{3} \times 4} = \frac{5}{4}$$

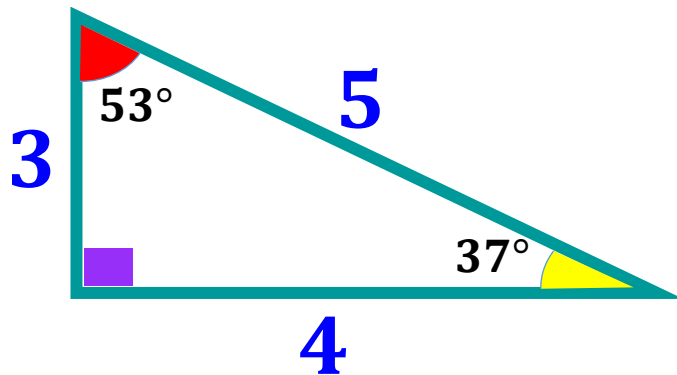
$$\text{III. } \sqrt{\cot 53^\circ} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \frac{\sqrt{3}}{2}$$

$\therefore \text{Ib; IIa; IIIc}$

2 Calcule:

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

Recordar:



 RESOLUCIÓN



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

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

$$M = \frac{\frac{25}{12}}{\frac{5}{4}} = \frac{\overset{5}{\cancel{25}} \times \overset{1}{\cancel{4}}}{\underset{3}{\cancel{12}} \times \underset{1}{\cancel{5}}}$$

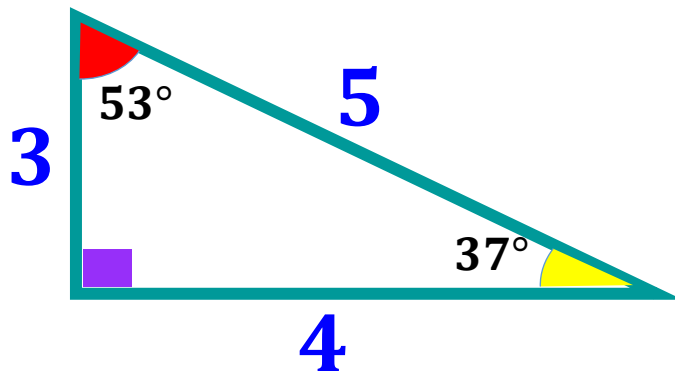
$$\therefore M = \frac{5}{3}$$



3 Calcule x si:

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

Recordar:



 **RESOLUCIÓN**

N:

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

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

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

$$5x + 3 = 5$$

$$5x = 2$$

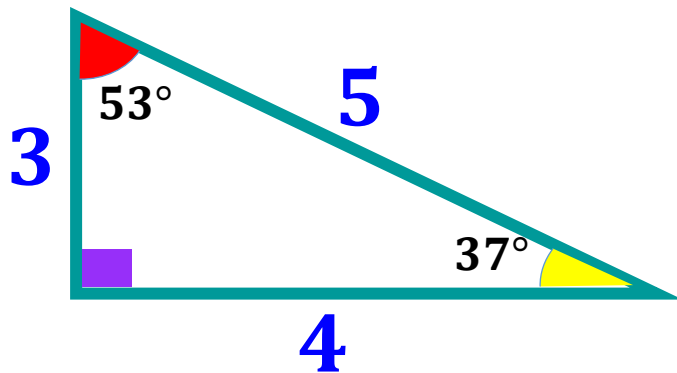
$$\therefore x = \frac{2}{5}$$



4 Calcule x si:

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

Recordar:



 RESOLUCIÓN

N:

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

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

$$4^{\left(\frac{(\cancel{2})(3)}{\cancel{4}_2}\right)} = 4^x$$

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

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

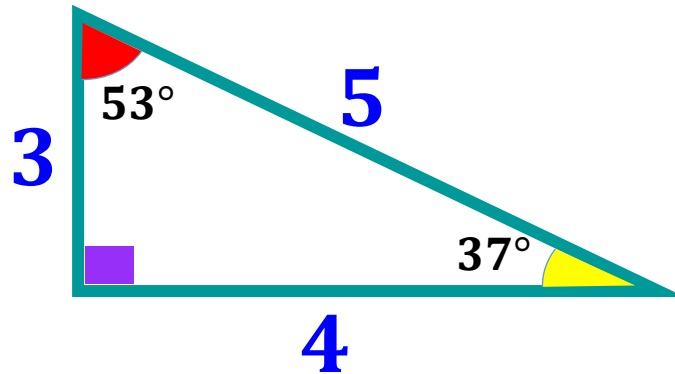


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Calcule x si:

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

Recordar:


RESOLUCIÓN

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

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

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

$$4x = 5x + 10$$

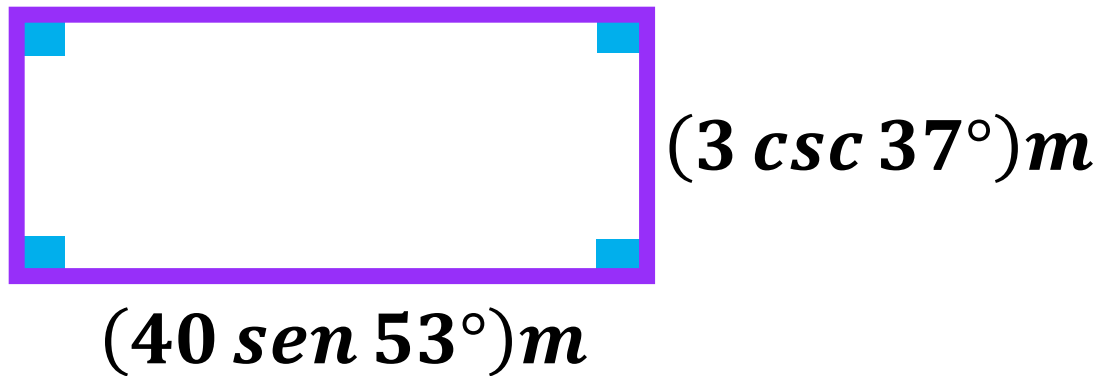
$$-10 = x$$

$$\therefore x = -10$$

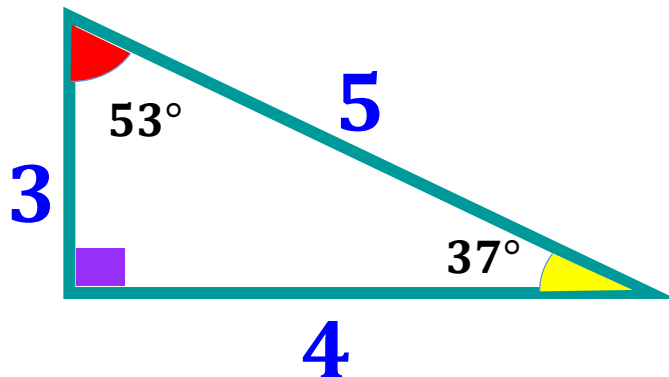


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Dorian ha comprado un terreno en la urbanización Los Lirios de San Juan de Miraflores tal como muestra la gráfica. Determine el área del terreno adquirido en metros cuadrados.



Recordar:



RESOLUCIÓN

$$A_{\blacksquare} = (BASE) \times (ALTURA)$$

$$A_{\blacksquare} = (40 \operatorname{sen} 53^\circ) \times (3 \operatorname{csc} 37^\circ)$$

$$A_{\blacksquare} = \left[\overset{8}{\cancel{40}} \cdot \left(\overset{4}{\cancel{4}} \underset{1}{\cancel{5}} \right) \right] \times \left[\cancel{3} \cdot \left(\overset{5}{\cancel{5}} \cancel{3} \right) \right]$$

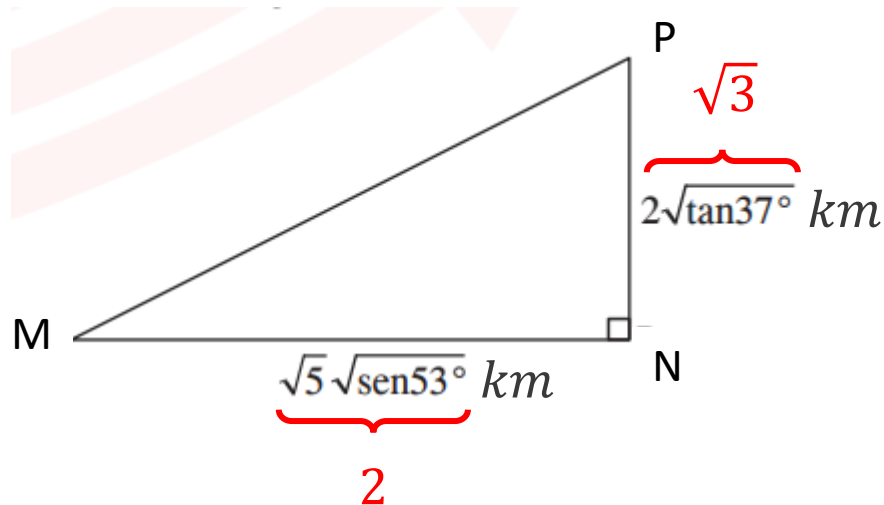
$$A_{\blacksquare} = 32 \times 5$$

$$\therefore A_{\blacksquare} = 160m^2$$



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



RESOLUCIÓN

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

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

Teorema de Pitágoras

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

$$MP^2 = 4 + 3$$

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