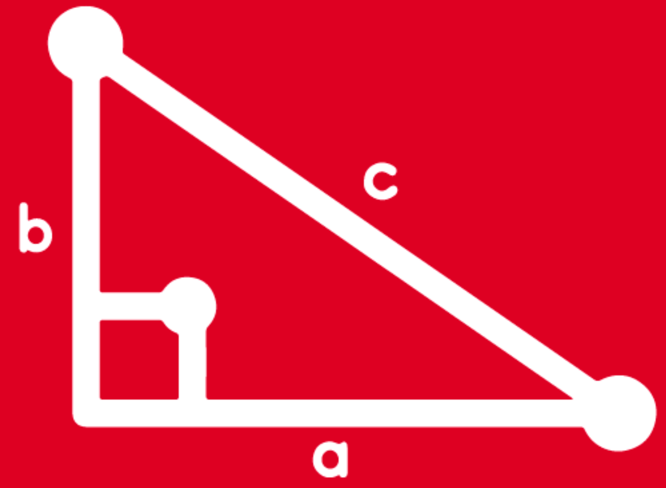
TRIGONOMETRY

Chapter 6

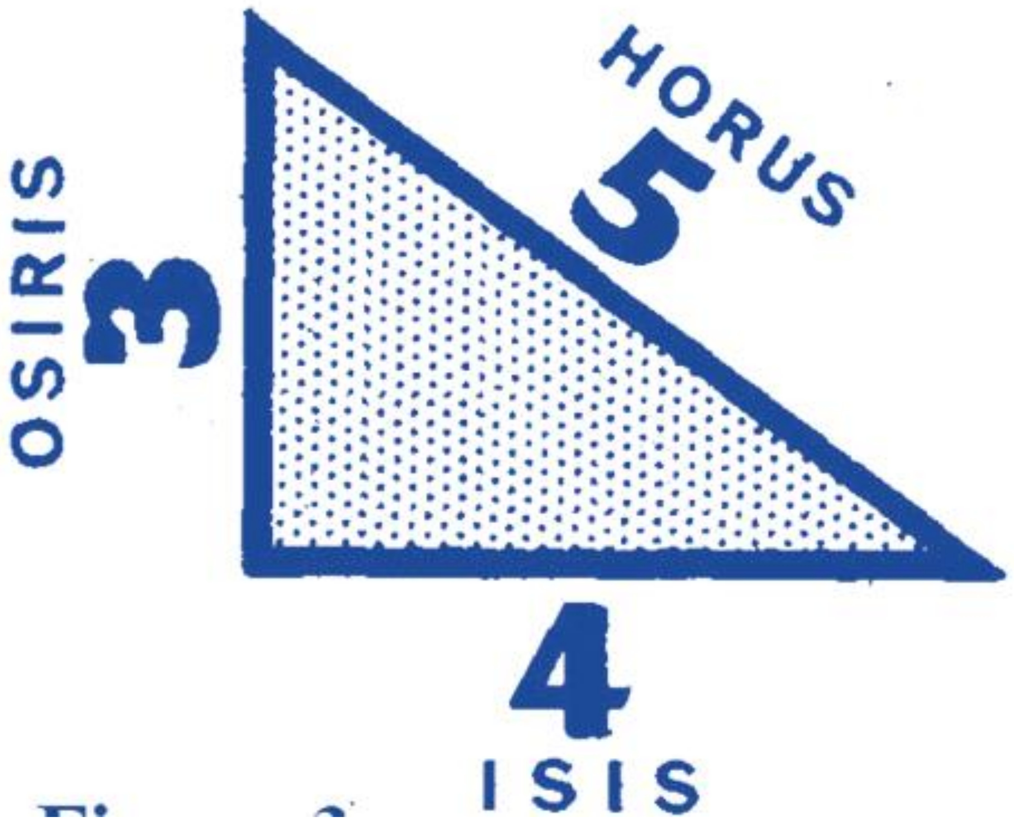
2nd
SECONDARY



Razones trigonométricas de los ángulos 37° y 53°

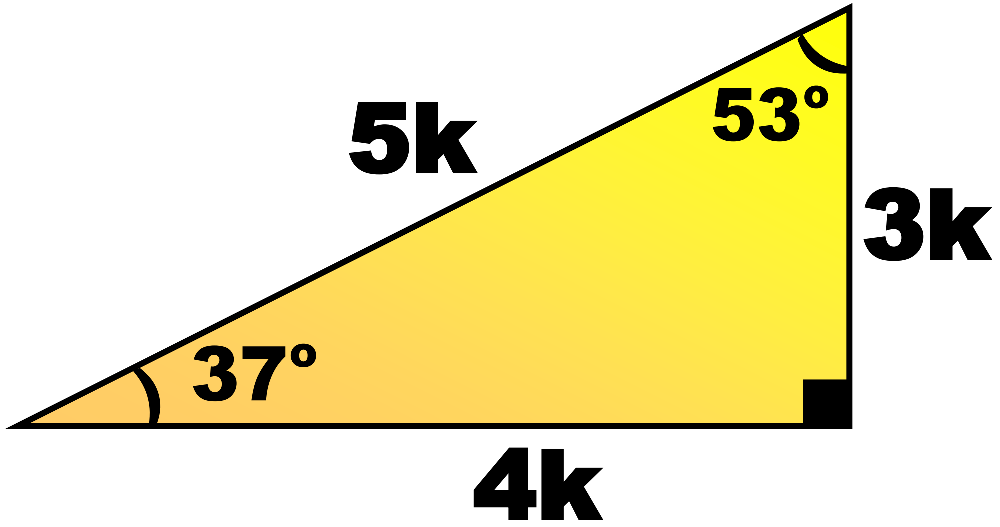
SACO OLIVEROS

EL TRIÁNGULO EGIPCIO SAGRADO



RAZONES TRIGONOMÉTRICAS DE ÁNGULOS NOTABLES DE 37° Y 53°

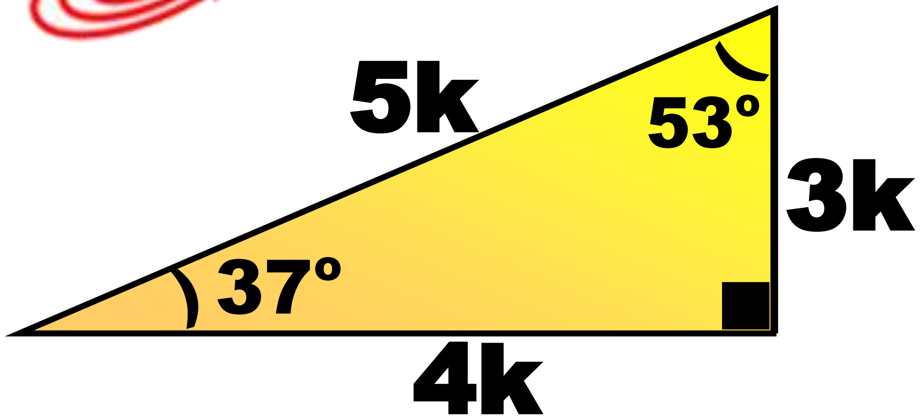
Para el cálculo de sus R.T recordaremos el ◣ de 37° y 53°



Además:

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

Veamos:



$$sen37° = \frac{CO}{H} = \frac{3\cancel{k}}{5\cancel{k}} \Rightarrow sen37° = \frac{3}{5}$$

$$cos37° = \frac{CA}{H} = \frac{4\cancel{k}}{5\cancel{k}} \Rightarrow cos37° = \frac{4}{5}$$

$$tan37° = \frac{CO}{CA} = \frac{3\cancel{k}}{4\cancel{k}} \Rightarrow tan37° = \frac{3}{4}$$

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	$\frac{5}{3}$	$\frac{5}{4}$

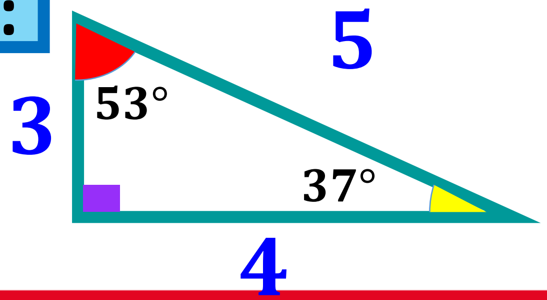
1 Dadas las columnas:

I. $\cos^2 53°$ — a. $\dfrac{5}{4}$

II. $\dfrac{\csc 37°}{\tan 53°}$ — b. $\dfrac{9}{25}$

III. $\sqrt{\cot 53°}$ — c. $\dfrac{\sqrt{3}}{2}$

Recordar:



RESOLUCIÓN:

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

II. $\dfrac{\csc 37°}{\tan 53°} = \dfrac{\frac{5}{3}}{\frac{4}{3}} = \dfrac{5 \times \cancel{3}}{\cancel{3} \times 4} = \dfrac{5}{4}$

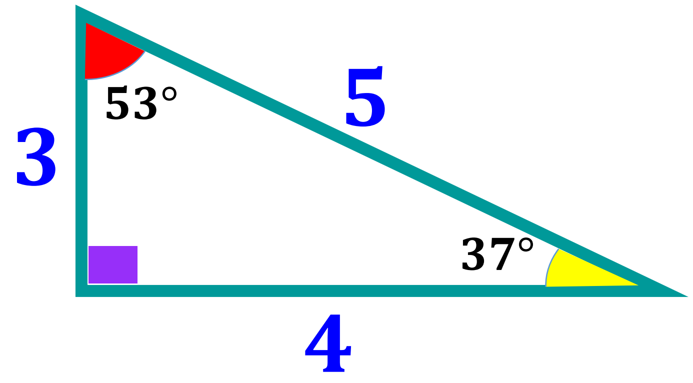
III. $\sqrt{\cot 53°} = \sqrt{\dfrac{3}{4}} = \dfrac{\sqrt{3}}{\sqrt{4}} = \dfrac{\sqrt{3}}{2}$

$\therefore Ib; IIa; IIIc$

2 Calcule

$$M = \frac{tan\,53° + tan\,37°}{csc\,53°}$$

Recordar:



RESOLUCIÓN:

$$M = \frac{tan\,53° + tan\,37°}{csc\,53°}$$

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

$$M = \frac{\frac{25}{12}}{\frac{5}{4}} = \frac{\cancel{25}^{5} \times \cancel{4}^{1}}{\cancel{12}_{3} \times \cancel{5}_{1}}$$

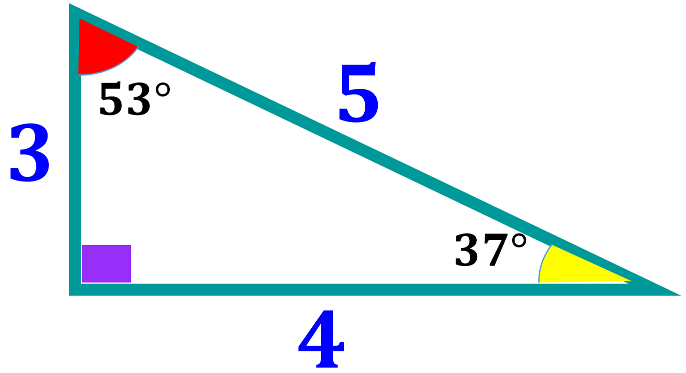
$$\therefore M = \frac{5}{3}$$

3

Calcule x si:

$$x\,.\sec 37° + \cot 53° = \csc 53°$$

Recordar:



RESOLUCIÓN:

$$x\sec 37° + \cot 53° = \csc 53°$$

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

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

$$5x + 3 = 5$$

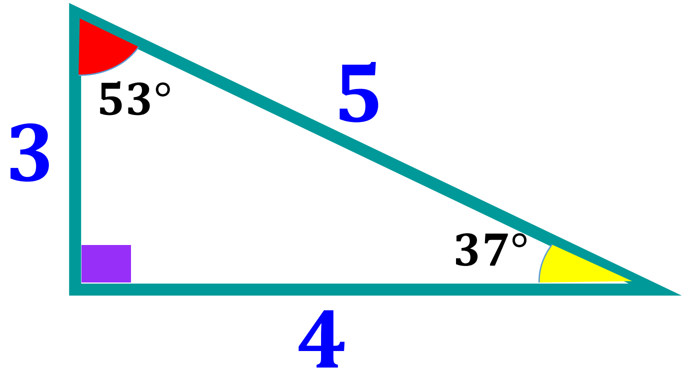
$$5x = 2$$

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

4 Calcule x si:

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

Recordar:



RESOLUCIÓN:

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

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

$$4^{\left(\frac{(\cancel{2}^{1})(3)}{\cancel{4}_{2}}\right)} = 4^x$$

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

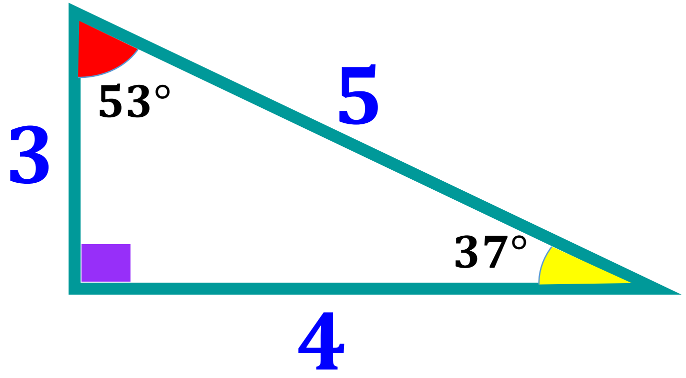
$$\boxed{\therefore\ x = \frac{3}{2}}$$

5

Calcule x si:

$$\frac{sen\,37°}{tan\,37°} = \frac{x+2}{x}$$

Recordar:



RESOLUCIÓN:

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

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

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

$$4x = 5x + 10$$

$$-10 = x$$

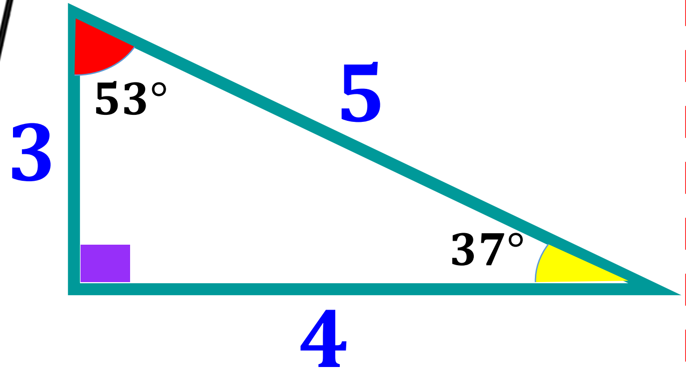
$$\therefore\ x = -10$$

6 Calcule x si:

$$5x\,sen\,37° + 10\,sen\,53° = 14\,cos\,53°\,csc\,37°$$

RESOLUCIÓN:

Recordar:



$$5x\,.\,sen\,37° + 10.\,sen\,53° = 14.\,cos\,53°.\,csc\,37°$$

$$\cancel{5}x \cdot \left(\frac{3}{\cancel{5}}\right) + \overset{2}{\cancel{10}} \cdot \left(\frac{4}{\underset{1}{\cancel{5}}}\right) = 14 \cdot \left(\frac{\cancel{3}}{\cancel{5}}\right) \cdot \left(\frac{\cancel{5}}{\cancel{3}}\right)$$

$$3x + 8 = 14$$

$$3x = 6$$

$$\boxed{\therefore\ x = 2}$$

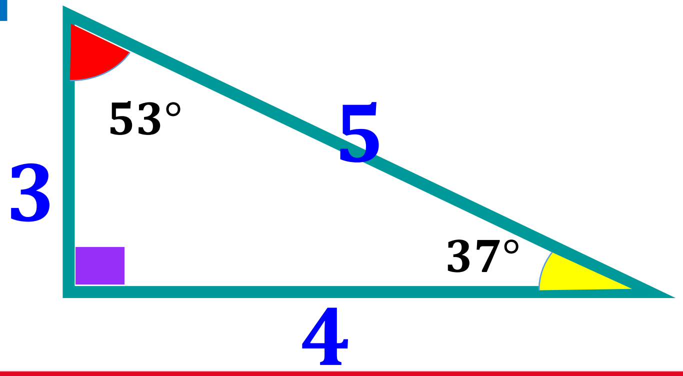
7

Dorian heredó un terreno en forma rectangular (como muestra la figura). Calcule el área de dicho terreno.

$$(3\,csc\,37°)m$$

$$(40\,sen\,53°)m$$

Recordar:



RESOLUCIÓN:

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

$$A_{\blacksquare} = (40\,sen\,53°) \times (3\,csc\,37°)$$

$$A_{\blacksquare} = \left[\cancel{40}^{\,8} \cdot \left(\frac{4}{\cancel{5}_{\,1}}\right)\right] \times \left[\cancel{3} \cdot \left(\frac{5}{\cancel{3}}\right)\right]$$

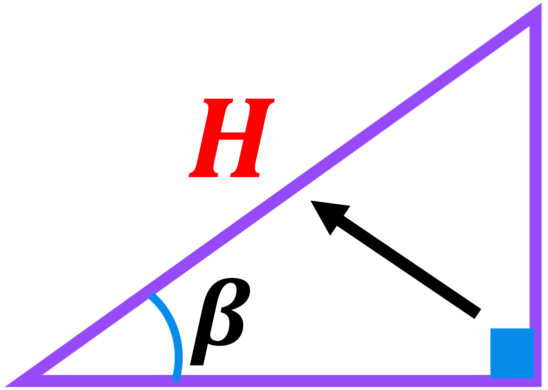
$$A_{\blacksquare} = 32 \times 5$$

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

8

De la figura, efectúe:

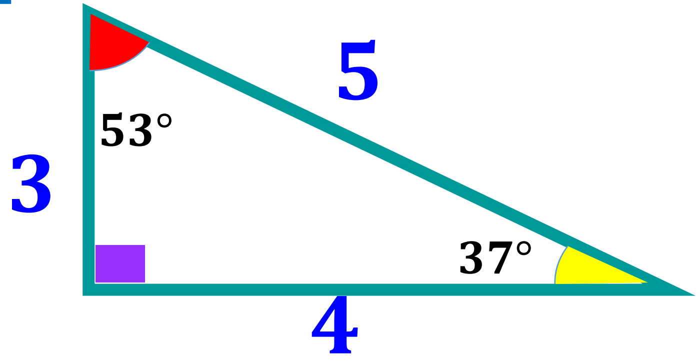
$$P = cos^2\beta$$



$2\sqrt{tan\,37°} = \sqrt{3}$

$\sqrt{5}\sqrt{sen\,53°} = 2$

Recordar:



RESOLUCIÓN:

$$2\sqrt{tan\,37°} = 2 \times \left(\sqrt{\frac{3}{4}}\right) = \cancel{2} \times \left(\frac{\sqrt{3}}{\cancel{2}}\right) = \sqrt{3}$$

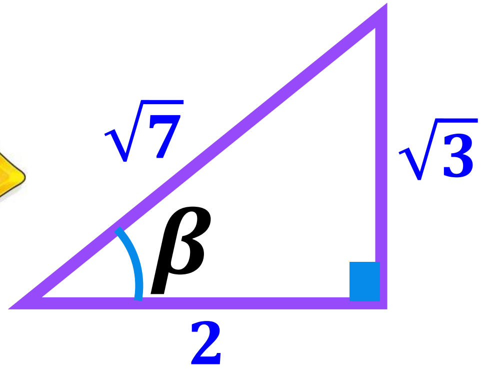
$$\sqrt{5}\sqrt{sen\,53°} = \sqrt{5} \times \left(\sqrt{\frac{4}{5}}\right) = \cancel{\sqrt{5}} \times \left(\frac{2}{\cancel{\sqrt{5}}}\right) = 2$$

Por el Teorema de Pitágoras:

$$(H)^2 = \left(\sqrt{3}\right)^2 + (2)^2$$

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

$$H = \sqrt{7}$$



Piden:

$$P = cos^2\beta$$

$$P = \left(\frac{2}{\sqrt{7}}\right)^2$$

$$\therefore P = \frac{4}{7}$$