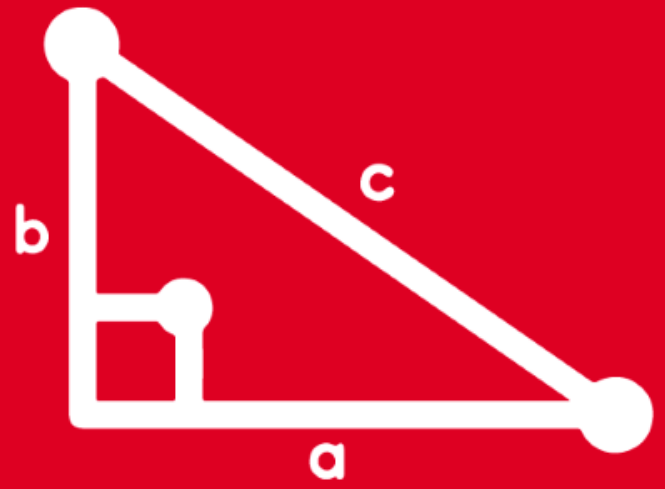
TRIGONOMETRY

Tomo 8



3rd
SECONDARY

Review

SACO OLIVEROS

HELICO-PRACTICA

1) Calcule $\text{sen}75°$

Recordar

$$\text{sen}(\alpha + \beta) = \text{sen}\alpha\,\cos\beta + \cos\alpha\,\text{sen}\beta$$

Resolución:

$$\text{sen}(45° + 30°) = \text{sen}45°\cos30° + \cos45°\text{sen}30°$$

$$\text{sen}15° = \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \cdot \frac{1}{2}$$

$$\therefore \quad \text{sen}15° = \frac{\sqrt{6} + \sqrt{2}}{4}$$

HELICO-PRACTICE

2) Determine el valor de:

$$P = \frac{\text{sen}50°.\cos 12° - \cos 50°.\text{sen}12°}{\cos 27°.\cos 25° - \text{sen}27°.\text{sen}25°}$$

Recordar

$$\text{sen}\alpha\cos\beta - \cos\alpha\text{sen}\beta = \text{sen}(\alpha - \beta)$$
$$\cos\alpha\cos\beta - \text{sen}\alpha\text{sen}\beta = \cos(\alpha + \beta)$$

Resolución:

$$\therefore P = \frac{\text{sen}(50° - 12°)}{\cos(27° + 25°)} = \frac{\text{sen}38°}{\cos 52°} = \frac{\text{sen}38°}{\text{sen}38°} = 1$$

HELICO-PRACTICE

3) Si $\tan x = \frac{1}{5}$ y $\tan y = 2$, calcule $\tan(x + y)$

Resolución:

$$\tan(x + y) = \frac{\frac{1}{5} + 2}{1 - (\frac{1}{5})(2)}$$

Recordar

$$\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x . \tan y}$$

$$\tan(x + y) = \frac{\frac{11}{5}}{1 - \frac{2}{5}} = \frac{\frac{11}{5}}{\frac{3}{5}} = \frac{11}{3}$$

HELICO-PRACTICE

4) Calcule M si :

$$M = 10.\text{sen}18°30'\cos 18°30'$$

Resolución:

$$M = 5.2\text{sen}18°30'\cos 18°30'$$

$$M = 5\text{sen}2(18°30')$$

$$M = 5\text{sen}37°$$

$$M = \cancel{5}\left(\frac{3}{\cancel{5}}\right)$$

$$M = 3$$

Recordar

$$\text{sen}(2\alpha) = 2\text{sen}\alpha\cos\alpha$$

HELICO-PRACTICE

5) Si θ es un ángulo agudo, tal que $\cos\theta = \frac{1}{\sqrt{10}}$, calcule $\cos 2\theta$.

Resolución:

$$\cos 2\theta = 2\left(\frac{1}{\sqrt{10}}\right)^2 - 1$$

$$\cos 2\theta = 2\left(\frac{1}{10}\right) - 1$$

$$\cos 2\theta = \frac{1}{5} - 1 = -\frac{4}{5}$$

Recordar

$$\cos 2\theta = 2\cos^2\theta - 1$$

HELICO-PRACTICE

6) Siendo β un ángulo agudo, tal que $\tan\beta = \frac{1}{5}$, calcule $\tan 2\beta$.

Resolución:

$$\tan 2\beta = \frac{2\left(\frac{1}{5}\right)}{1 - \left(\frac{1}{5}\right)^2}$$

$$\tan 2\beta = \frac{\frac{2}{5}}{1 - \frac{1}{25}} = \frac{\frac{2}{5}}{\frac{24}{25}} = \frac{\cancel{50}}{\cancel{120}}$$

$$\tan 2\beta = \frac{5}{12}$$

Recordar

$$\tan 2\beta = \frac{2\tan\beta}{1 - \tan^2\beta}$$

HELICO-PRACTICE

7) Reduzca $E = \dfrac{1 - \cos 2\alpha}{\operatorname{sen} 2\alpha}$

Resolución:

$$E = \frac{2\operatorname{sen}^2\alpha}{2\operatorname{sen}\alpha.\cos\alpha}$$

$$E = \frac{\operatorname{sen}\alpha}{\cos\alpha}$$

$$\therefore E = \tan\alpha$$

Recordar

$$2\operatorname{sen}^2\alpha = 1 - \cos 2\alpha$$

HELICO-PRACTICE

8) Efectúe T = (cot18° - tan18°) tan36°

Resolución:

T = 2 cot2(18°). tan36°

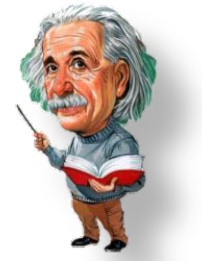
T = 2 cot36°. tan36°

∴ T = 2(1) = 2

Recordar

$$\cot\alpha - \tan\alpha = 2\cot 2\alpha$$

$$\tan\alpha . \cot\alpha = 1$$



HELICO-PRACTICE

9) Siendo $\text{senx} + \cos x = \sqrt{\frac{3}{7}}$; calcule sen2x.

Resolución:

$$(\text{senx} + \cos x)^2 = \left(\sqrt{\frac{3}{7}}\right)^2$$

$$1 + \text{sen2x} = \frac{3}{7}$$

$$\text{Sen2x} = \frac{3}{7} - 1$$

$$\text{sen2x} = -\frac{4}{7}$$

Recordar

$$(\text{sen}\alpha + \cos\alpha)^2 = 1 + \text{sen2}\alpha$$

HELICO-PRACTICE

10) Al copiar de la pizarra la expresión $1 + \tan^2 8°$, Luis cometió un error y escribió $1 - \tan^2 8°$. Determine la razón entre lo que estaba escrito en la pizarra y lo que escribió Luis.

Resolución:

$$E = \frac{1 + \tan^2 8°}{1 - \tan^2 8°}$$

$$E = \sec 2(8°)$$

$$E = \sec(16°)$$

$$E = \frac{25}{24}$$

Recordar

$$\sec 2x = \frac{1 + \tan^2 x}{1 - \tan^2 x}$$