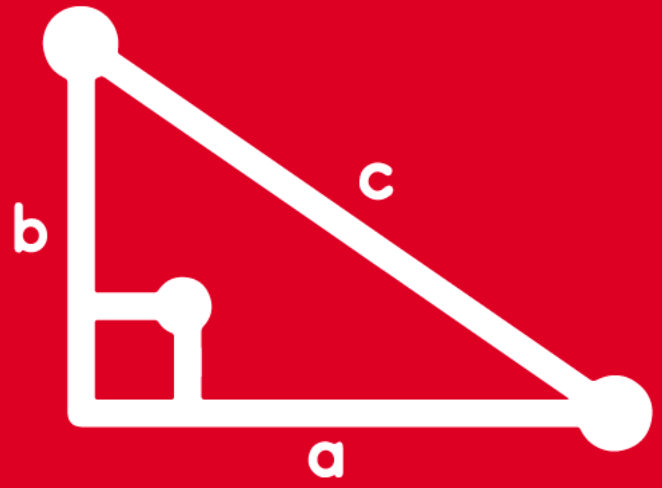
TRIGONOMETRY

TOMO VII
Sesión 2



4th
SECONDARY

Feedback

SACO OLIVEROS

RETROALIMENTACIÓN

PROBLEMA 1

Si $\boldsymbol{cot\theta + tan\theta = 7}$ **,** calcule $\boldsymbol{K = sen2\theta}$.

Resolución:

***Recordar*:**

$$\boxed{\boldsymbol{cot\theta + tan\theta = 2csc2\theta}}$$

Tenemos como dato:

$$\underbrace{cot\theta + tan\theta}_{} = 7$$

$$2csc2\theta = 7$$

$$csc2\theta = \frac{7}{2} \Rightarrow \boxed{sen2\theta = \frac{2}{7}}$$

Nos piden: $K = sen2\theta$

$$K = \frac{2}{7}$$

$$\therefore \boxed{\boldsymbol{K = \frac{2}{7}}}$$

RETROALIMENTACIÓN

PROBLEMA 2

Reduzca

$$M = (cotx - tanx).sen2x$$

Resolución:

Recordamos

$$cotx - tanx = 2cot2x$$

Tenemos:

$$M = \underbrace{(cotx - tanx)}_{2cot2x}.sen2x$$

$$M = 2cot2x.sen2x$$

$$M = 2.\frac{cos2x}{\cancel{sen2x}}.\cancel{sen2x}$$

$$\therefore \boxed{M = 2cos2x}$$

RETROALIMENTACIÓN

PROBLEMA 3

$$\boldsymbol{Reducir\ G = \sqrt{\frac{1+sen10°}{1-sen10°}}}$$

Resolución:

Recordamos

- $\boldsymbol{2sen^2x = 1 - cos2x}$
- $\boldsymbol{2cos^2x = 1 + cos2x}$

Tenemos:

$$G = \sqrt{\frac{1+sen10°}{1-sen10°}} = \sqrt{\frac{1+cos80°}{1-cos80°}}$$

$$G = \sqrt{\frac{\cancel{2}cos^2 40°}{\cancel{2}sen^2 40°}} = \sqrt{cot^2 40°}$$

$$\therefore \boxed{\boldsymbol{G = cot40°}}$$

RETROALIMENTACIÓN

PROBLEMA 4

Si $m = 4cos^3 20° - 3cos20°$

$n = 3sen40° - 4sen^3 40°$

Calcule $E = m^2 + n^2$

Resolución:

$$m = \underbrace{4cos^3 20° - 3cos20°}_{\cos(3.20°)}$$

$$m = cos60° \Rightarrow m = \frac{1}{2}$$

$$n = \underbrace{3sen40° - 4sen^3 40°}_{sen(3.40°)}$$

$$n = sen120° \Rightarrow n = \frac{\sqrt{3}}{2}$$

Nos piden:

$$E = m^2 + n^2$$

$$E = \left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2$$

$$E = \frac{1}{4} + \frac{3}{4}$$

$$\therefore \boxed{E = 1}$$

RETROALIMENTACIÓN

PROBLEMA 5

Si $tan\theta = \frac{1}{3}$, calcule $tan3\theta$

Resolución:

Recordar:

$$tan3\theta = \frac{3tan\theta - tan^3\theta}{1 - 3tan^2\theta}$$

Tenemos como dato: $tan\theta = \frac{1}{3}$

$$tan3\theta = \frac{\cancel{3}\left(\frac{1}{\cancel{3}}\right) - \left(\frac{1}{3}\right)^3}{1 - 3\left(\frac{1}{3}\right)^2}$$

$$tan3\theta = \frac{1 - \frac{1}{27}}{1 - \frac{1}{3}} = \frac{\frac{26}{27}}{\frac{2}{3}}$$

$$tan3\theta = \frac{\cancel{26}\,.\,\cancel{3}}{\cancel{27}\,.\,\cancel{2}}$$

$$\therefore \boxed{tan3\theta = \frac{13}{9}}$$

RETROALIMENTACIÓN

PROBLEMA 6

Simplifique

$$E = \frac{cos3x}{cosx} - 2\cos 2x$$

Resolución:

Recordar:

$$cos3x = cosx(2cos2x - 1)$$

Nos piden simplificar:

$$E = \frac{cos3x}{cosx} - 2\cos 2x$$

$$E = \frac{\cancel{cosx}(2cos2x - 1)}{\cancel{cosx}} - 2\cos 2x$$

$$E = \cancel{2cos2x} - 1 + \cancel{-2\cos 2x}$$

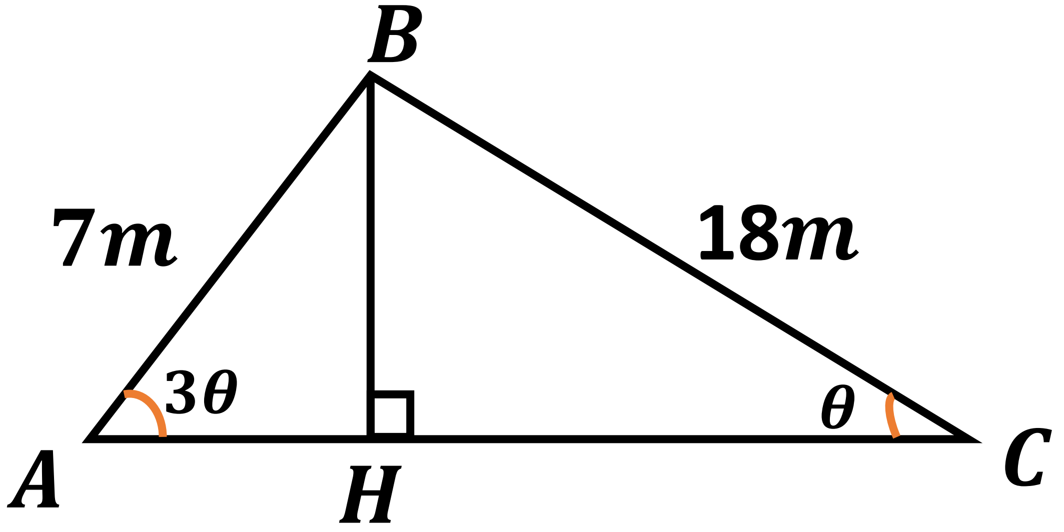
$$\boxed{\therefore\ E = -1}$$

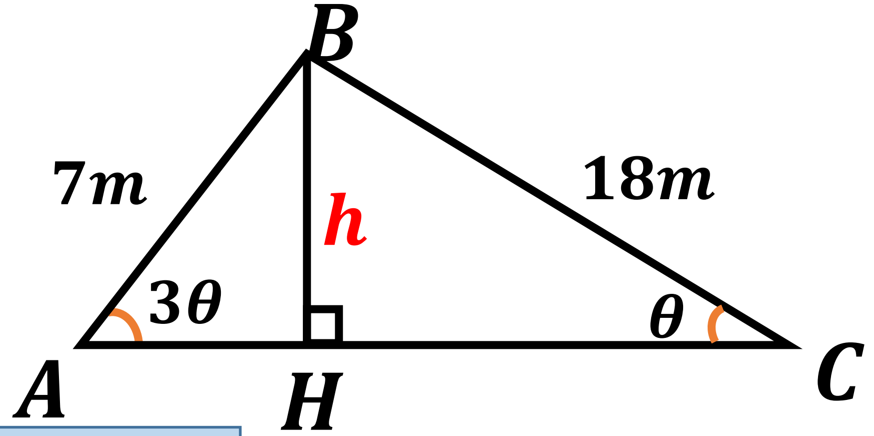
RETROALIME

Resolución:

PROBLEMA 7

Se construye un minimarket sobre un terreno que tiene la forma de un triángulo ABC, tal como se muestra en la figura. Determine el valor de $\boldsymbol{cos2\theta}$.





Recordar:

$$sen3\theta = sen\theta(2cos2\theta + 1)$$

$$\frac{h}{7} = \frac{h}{18}(2cos2\theta + 1)$$

$$18.\cancel{h} = 7.\cancel{h}(2cos2\theta + 1)$$

$$18 = 14cos2\theta + 7$$

$$11 = 14cos2\theta$$

$$\therefore \boxed{cos2\theta = \frac{11}{14}}$$

RETROALIMENTACIÓN

PROBLEMA 8

Simplifique

$$G = 2\cos 3x \cdot \cos x - \cos 4x$$

Resolución:

Recordamos

$$2\cos x \cdot \cos y = \cos(x+y) + \cos(x-y)$$

Tenemos:

$$G = \underbrace{2\cos 5x \cdot \cos 2x}_{\cos(5x+2x) + \cos(5x-2x)} - \cos 7x$$

$$G = \cancel{\cos 7x} + \cos 2x - \cancel{\cos 7x}$$

$$G = \cos 2x$$

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

RETROALIMENTACIÓN

PROBLEMA 9

Determinar el valor de α, siendo este agudo.

$$2\text{sen}58° \cdot \text{sen}8° + \cos 66° = \text{sen}4\alpha$$

Resolución:

Recordamos

$$2\text{sen}x \cdot \text{sen}y = \cos(x-y) - \cos(x+y)$$

Tenemos:

$$\underbrace{2\text{sen}58° \cdot \text{sen}8°}_{\cos(58°-8°)\ -\ \cos(58°+8°)} + \cos 66° = \text{sen}4\alpha$$

$$\cos 50° - \cancel{\cos 66°} + \cancel{\cos 66°} = \text{sen}4\alpha$$

$$\cos 50° = \text{sen}4\alpha$$

Sabemos por RT complementarias:

$$50° + 4\alpha = 90°$$

$$4\alpha = 40°$$

$$\therefore \boxed{\alpha = 10°}$$

RETROALIMENTACIÓN

PROBLEMA 10

Reducir

$$W = \frac{\text{sen}20\alpha}{2\text{sen}8\alpha \cdot \cos 2\alpha - \text{sen}6\alpha}$$

Resolución:

Recordamos

$$2\text{sen}x \cdot \cos y = \text{sen}(x+y) + \text{sen}(x-y)$$

$$\text{sen}2\alpha = 2\ \text{sen}a\,.\cos a$$

Tenemos:

$$W = \frac{\text{sen}20\alpha}{\underbrace{2\text{sen}8\alpha \cdot \cos 2\alpha}_{\text{sen}(8\alpha+2\alpha)\ +\ \text{sen}(8\alpha-2\alpha)} - \text{sen}6\alpha}$$

$$W = \frac{\text{sen}20\alpha}{\text{sen}10\alpha + \cancel{\text{sen}6\alpha} - \cancel{\text{sen}6\alpha}}$$

$$W = \frac{\text{sen}20\alpha}{\text{sen}10\alpha} = \frac{2\cancel{\text{sen}10\alpha}\,.\cos 10\alpha}{\cancel{\text{sen}10\alpha}}$$

$$\therefore \boxed{W = 2\cos 10\alpha}$$