



# fichas de Trabajo

## MATEMÁTICA

# 5<sup>to</sup>

# SECUNDARIA

## IDENTIDADES TRIGONOMÉTRICAS AUXILIARES

Son aquellas relaciones o expresiones que por el uso frecuente se han hecho conocidas, algunas de estas son:

1.  $\text{Tan}x + \text{Cot}x = \text{Sec}x \cdot \text{Csc}x = \frac{1}{\text{Sen}x \cdot \text{Cos}x}$
2.  $\text{Sec}^2x + \text{Csc}^2x = \text{Sec}^2x \cdot \text{Csc}^2x$
3.  $\text{Sen}^4x + \text{Cos}^4x = 1 - 2\text{Sen}^2x \cdot \text{Cos}^2x$
4.  $\text{Sen}^6x + \text{Cos}^6x = 1 - 3\text{Sen}^2x \cdot \text{Cos}^2x$
5.  $(1 \pm \text{Sen}x \pm \text{Cos}x)^2 = 2(1 \pm \text{Sen}x)(1 \pm \text{Cos}x)$

### Trabajando en Clase

#### Nivel II

1. Reduce:

$$E = (\text{Sec}x \cdot \text{Csc}x - \text{Tan}x) \cdot \text{Sen}x$$

2. Reduce:

$$Q = (\text{Sen}^2x - \text{Cos}^2x)^2 + 4\text{Sen}^2x \cdot \text{Cos}^2x$$

3. Reduce:

$$L = (\text{Tan}x + \text{Cot}x) \cdot \text{Cos}^2x$$

- Si:  $A = 9(\text{Sen}^4x + \text{Cos}^4x)$

$$B = 6(\text{Sen}^6x + \text{Cos}^6x)$$

$$\text{Además: } A - B = n$$

Halla el valor de  $n^2 + 9$

4. Reduce:

$$T = 3(\text{Sen}^4x + \text{Cos}^4x) - 2(\text{Sen}^6x + \text{Cos}^6x) + 4$$

#### Nivel II

5. Simplifica:

$$Q = \frac{(1 - \text{Sen}x - \text{Cos}x)^2}{2(1 - \text{Sen}x)} + \text{Cos}x$$

6. Simplificar:

$$E = \frac{(\text{Sec}^2x + \text{Csc}^2x)}{\text{Tan}x + \text{Cot}x} \cdot \text{Cos}x$$

- Si:  $\text{Sen}x + \text{Cos}x = \sqrt{\frac{2}{3}}$

$$\text{Calcula: } H = \text{Sen}^4x + \text{Cos}^4x$$

Resolución

$$\text{Dato: } \text{Sen}x + \text{Cos}x = \sqrt{\frac{2}{3}}$$

$$(\text{Sen}x + \text{Cos}x)^2 = \left(\sqrt{\frac{2}{3}}\right)^2$$

$$\underbrace{\text{Sen}^2x + \text{Cos}^2x}_{1} + 2\text{Sen}x \cdot \text{Cos}x = \frac{2}{3}$$

$$1 + 2\text{Sen}x \cdot \text{Cos}x = \frac{2}{3}$$

$$2\text{Sen}x \cdot \text{Cos}x = -\frac{1}{3}$$

$$\text{Sen}x \cdot \text{Cos}x = -\frac{1}{6}$$

$$\text{Piden: } H = \text{Sen}^4x + \text{Cos}^4x$$

$$H = 1 - 2\text{Sen}^2x \cdot \text{Cos}^2x$$

$$H = 1 - 2\left(-\frac{1}{6}\right)^2$$

$$H = 1 - 2\left(\frac{1}{36}\right) = \frac{17}{18}$$

7. Si:  $\text{Sen}x + \text{Cos}x = \sqrt{\frac{1}{3}}$

Calcula:  $N = \text{Sen}^6x + \text{Cos}^6x$

### Nivel III

8. Si  $\text{Sen}x + \text{Cos}x = n$

Determina:  $M = (1 + \text{Sen}x)(1 + \text{Cos}x)$

9. Si  $\text{Sec}^2x + \text{Csc}^2x = 81$  (x: agudo)

Calcula:  $M = \sqrt{(\text{Tan}x + \text{Cot}x)^3}$

10. Si  $\text{Sen}x \cdot \text{Cos}x = \frac{1}{4}$

Calcula  $N = \text{Sen}^2x \cdot \text{Tan}x + \text{Cos}^2x \cdot \text{Cot}x$

Resolución

$$N = \text{Sen}^2x \cdot \frac{\text{Sen}x}{\text{Cos}x} + \text{Cos}^2x \cdot \frac{\text{Cos}x}{\text{Sen}x}$$

$$N = \frac{\text{Sen}^3x}{\text{Cos}x} + \frac{\text{Cos}^3x}{\text{Sen}x}$$

$$N = \frac{\text{Sen}^4x + \text{Cos}^4x}{\text{Sen}x \text{Cos}x}$$

$$N = \frac{1 - 2\text{Sen}^2x \text{Cos}^2x}{\text{Sen}x \cdot \text{Cos}x}$$

$$N = \frac{1 - 2\left(\frac{1}{4}\right)^2}{\left(\frac{1}{4}\right)} = \frac{7}{2}$$

11. Si  $\text{Sen}x \cdot \text{Cos}x = \frac{1}{3}$

Calcula  $L = \text{Sen}^4x \cdot \text{Tan}x + \text{Cos}^4x \cdot \text{Cot}x$

12. Simplifica:

$$E = \sqrt{\frac{2(1 - \text{Sen}x)}{1 - \text{Cos}x}} + \frac{\text{Sen}x}{1 - \text{Cos}x}$$

(x ∈ IVC)

## Tarea domiciliaria N°6

1. Reduce:

$$Q = (\sec x \cdot \csc x - \cot x) \cos x$$

Rpta :

2. Reduce:

$$L = \frac{(\sin^2 x - \cos^2 x)^2 - 1}{\sin^2 x \cdot \cos^2 x}$$

Rpta :

3. Reduce:

$$L = (\tan x + \cot x) \sin^2 x$$

Rpta :

4. Reduce:

$$I = \sec^2 x \cdot \csc^2 x - \sec^2 x$$

Rpta :

5. Simplifica:

$$T = \frac{(1 - \text{Sen}x + \text{Cos}x)^2}{2(1 + \text{Cos}x)} - 1$$

Rpta :

6. Simplificar:

$$L = \frac{(\text{Sec}^2 x + \text{Csc}^2 x)}{\text{Tan}x + \text{Cot}x} \cdot \text{Sen}x$$

Rpta :

7. Halla "x", si:

$$(\text{Sec}x \cdot \text{Csc}x - \text{Tan}x) \text{Sen}x = \frac{1}{2}$$

Rpta :

8. Simplifica:

$$C = \frac{\text{Sen}^4 x + \text{Cos}^4 x - 1}{\text{Sen}^6 x + \text{Cos}^6 x - 1}$$

Rpta :