



fichas de Trabajo

MATEMÁTICA

4^{to}

SECUNDARIA

IDENTIDADES TRIGONOMÉTRICAS

Definición

Son aquellas igualdades entre las razones trigonométricas de una variable, las cuales se verifican para todo valor de la variable en que la razón trigonométrica que interviene se encuentra definida.

Clasificación

I. I.T. recíprocas

- ❖ $\text{Sen}x \text{Csc}x = 1 \Rightarrow \text{Csc}x = \frac{1}{\text{Sen}x}; \forall x \in \mathbb{R} - \{n\pi; n \in \mathbb{Z}\}$
- ❖ $\text{Cos}x \text{Sec}x = 1 \Rightarrow \text{Sec}x = \frac{1}{\text{Cos}x}; \forall x \in \mathbb{R} - \{(2n+1)\frac{\pi}{2}; n \in \mathbb{Z}\}$
- ❖ $\text{Tan}x \text{Cot}x = 1 \Rightarrow \text{Cot}x = \frac{1}{\text{Tan}x}; \forall x \in \mathbb{R} - \{\frac{n\pi}{2}; n \in \mathbb{Z}\}$

II. I.T. por división

- ❖ $\text{Tan}x = \frac{\text{Sen}x}{\text{Cos}x}; \forall x \in \mathbb{R} - \{(2n+1)\frac{\pi}{2}; n \in \mathbb{Z}\}$
- ❖ $\text{Cot}x = \frac{\text{Cos}x}{\text{Sen}x}; \forall x \in \mathbb{R} - \{n\pi; n \in \mathbb{Z}\}$

III. I.T. Pitágoras

- ❖ $\text{Sen}^2x + \text{Cos}^2x = 1; \forall x \in \mathbb{R} \begin{cases} \text{Sen}^2x = 1 - \text{Cos}^2x \\ \text{Cos}^2x = 1 - \text{Sen}^2x \end{cases}$
- ❖ $\text{Sec}^2x - \text{Tan}^2x = 1; \forall x \in \mathbb{R} - \{(2n+1)\frac{\pi}{2}; n \in \mathbb{Z}\} \begin{cases} \text{Sec}^2x = \text{Tan}^2x + 1 \\ \text{Tan}^2x = \text{Sec}^2x - 1 \end{cases}$
- ❖ $\text{Csc}^2x - \text{Cot}^2x = 1; \forall x \in \mathbb{R} - \{n\pi; n \in \mathbb{Z}\} \begin{cases} \text{Csc}^2x = \text{Cot}^2x + 1 \\ \text{Cot}^2x = \text{Csc}^2x - 1 \end{cases}$

Trabajando en Clase

Nivel I

1. Reduce:

$$E = \text{Tan}x \cdot \text{Cos}x \cdot \text{Csc}x$$

2. Simplifica:

$$K = \text{Cot}x \cdot \text{Sen}x - \text{Cos}^2x \cdot \text{Sec}x$$

3. Reduce:

$$M = (\text{Tan}x \cdot \text{Cos}x + \text{Sen}x) \text{Csc}x$$

• Simplifica:

$$E = \frac{\text{Sen}x}{\text{Csc}x} + \frac{\text{Cos}x}{\text{Sec}x} + \frac{\text{Cot}x}{\text{Tan}x}$$

Resolución:

$$E = \text{Sen}x \cdot \frac{1}{\text{Csc}x} + \text{Cos}x \cdot \frac{1}{\text{Sec}x} + \text{Cos}x \cdot \frac{1}{\text{Tan}x}$$

$$E = \text{Sen}x \cdot \text{Sen}x + \text{Cos}x \cdot \text{Cos}x + \text{Cot}x \cdot \text{Cot}x$$

$$E = \text{Sen}^2x + \text{Cos}^2x + \text{Cot}^2x$$

$$E = 1 + \text{Cot}^2x$$

$$\therefore E = \text{Csc}^2x$$

4. Simplifica:

$$M = \frac{\text{Sec}x}{\text{Cos}x} - \frac{\text{Tan}x}{\text{Cot}x} - \frac{\text{Sen}x}{\text{Csc}x}$$

Nivel II

5. Reduce: $A = \text{Sen}^2x \cdot \text{Cot}^2x + \text{Cos}^2x \cdot \text{Tan}^2x$

6. Reduce: $B = (2\text{Sen}x + \text{Cos}x)^2 + (\text{Sen}x - 2\text{Cos}x)^2$

7. Simplifica:

$$M = \frac{\text{Sen}^4x - \text{Sen}^6x}{\text{Cos}^4x - \text{Cos}^6x}$$

Nivel III

8. Simplifica:

$$E = \frac{1 + \text{Sen}^2x}{1 + \text{Csc}^2x} + \frac{1 + \text{Cos}^2x}{1 + \text{Sec}^2x}$$

9. Reduce:

$$A = (\text{Sen}x + \text{Csc}x)^2 + (\text{Cos}x + \text{Sec}x)^2 - (\text{Tan}x + \text{Cot}x)^2$$

10. Reduce:

11. Reduce:

$$M = \text{Sen}x(\text{Csc}x + \text{Sen}x) + \text{Cos}x(\text{Sec}x + \text{Cos}x) + 1$$

12. Simplifica:

$$E = \frac{\text{Sen}^4x - \text{Cos}^4x + 2\text{Cos}^2x}{\text{Cos}^4x - \text{Sen}^4x + 2\text{Sen}^2x}$$

Tarea domiciliaria N° 5

1. Reduce: $K = \tan x \cdot \cos x \cdot \sin x$

Rpta :

2. Reduce: $M = \cot x \cdot \cos x \cdot \sin x$

Rpta :

3. Reduce: $A = \cos x \cdot \tan x \cdot \csc x$

Rpta :

4. Reduce: $M = \sin^3 x \cdot \csc x + \cos^3 x \cdot \sec x$

Rpta :

5. Reduce: $C = \text{Sen}^2x \cdot \text{Sec}x + \text{Cos}x$

Rpta :

6. Reduce:

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

Rpta :

7. Simplifica:

$$L = \frac{\text{Sen}x}{1 - \text{Cot}x} + \frac{\text{Cos}x}{1 - \text{Tan}x}$$

Rpta :

8. Simplifica:

$$K = \text{Tan}x(1 + \text{Cos}x) - \text{Sen}^2x \text{Csc}x$$

Rpta :