



IDENTIDADES TRIGONOMÉTRICAS AUXILIARES

Del tema anterior sabemos que:

- ▶ $\text{Tan}x = \frac{\text{Sen}x}{\text{Cos}x}$
- ▶ $\text{Cot}x = \frac{\text{Cos}x}{\text{Sen}x}$
- ▶ $\text{Sen}^2x + \text{Cos}^2x = 1$

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

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

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

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

$$\text{Tan}x + \text{Cot}x = \text{Sec}x \text{ Csc}x$$

▶ Tenemos las siguientes identidades trigonométricas auxiliares.

1. $\text{Tan}x + \text{Cot}x = \text{Sec}x \text{ Csc}x$
2. $\text{Sec}^2x + \text{Csc}^2x = \text{Sec}^2x \text{ Csc}^2x$
3. $\text{Sen}^4x + \text{Cos}^4x = 1 - 2\text{Sen}^2x \text{ Cos}^2x$
4. $\text{Sen}^6x + \text{Cos}^6x = 1 - 3\text{Sen}^2x \text{ Cos}^2x$
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

Integral

1. Reduce:

$$Q = \text{Tan}x - \text{Sec}x \text{ Csc}x$$

2. Si: $\text{Sen}x \text{ Cos}x = 1/3$

Calcula:

$$E = \text{Sen}^6x + \text{Cos}^6x$$

3. Simplifica:

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

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4. Si: $\text{Tan}x + \text{Cot}x = 4$

Calcula:

$$E = \text{Sec}^2x + \text{Csc}^2x$$

Resolución:

$$\text{Dato: } \text{Tan}x + \text{Cot}x = 4$$

$$\text{Sec}x \cdot \text{Csc}x = 4$$

Piden:

$$E = \text{Sec}^2x + \text{Csc}^2x$$

$$E = \text{Sec}^2x \cdot \text{Csc}^2x$$

$$E = (\text{Sec}x \cdot \text{Csc}x)^2$$

$$E = (4)^2$$

$$E = 16$$

5. Si: $\text{Sec}^2x + \text{Csc}^2x = 25$

Determina el valor de: $\text{Tan}x + \text{Cot}x$

6. Calcula:

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

7. Simplifica:

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

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8. Si: $\text{Tan}x + \text{Cot}x = 3$

Calcula: $E = \text{Sec}x + \text{Csc}x$

Resolución:

Dato: $\text{Tanx} + \text{Cotx} = 3$

$$\text{Secx} \cdot \text{Cscx} = 3$$

Piden: $E = \text{Secx} + \text{Cscx}$

$$E^2 = (\text{Secx} + \text{Cscx})^2$$

$$E^2 = \text{Sec}^2x + \text{Csc}^2x + 2\text{Secx} \cdot \text{Cscx}$$

$$E^2 = (3)^2 + 2(3)$$

$$E^2 = 15$$

$$E = \sqrt{15}$$

9. Si: $\text{Tanx} + \text{Cotx} = 4$

Calcula: $Q = \text{Secx} - \text{Cscx}$

10. Si: $\text{Sen}^4x - \text{Cos}^6x = m$ y $\text{Cos}^4x - \text{Sen}^6x = n$

Calcula: $E = \text{Sec}^2x + \text{Csc}^2x$

11. Si: $\text{Senx} - \text{Cosx} = 2/3$

Calcula el valor de: $P = (1 + \text{Senx})(1 - \text{Cosx})$

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12. Si: $\text{Sen}^4x + \text{Cos}^4x = 2/3$

Determina: $\text{Sen}^6x + \text{Cos}^6x$

Resolución:

$$\text{Sen}^4x + \text{Cos}^4x = 2/3$$

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

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

$$\text{Sen}^2x \cdot \text{Cos}^2x = 1/6$$

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

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

$$1 - 3(1/6) =$$

$$1 - 1/2 =$$

$$1/2$$

13. Si: $\text{Tanx} + \text{Cotx} = 5$

Calcula el valor de:

$$P = \text{Tanx} \cdot \text{Sen}^2x + \text{Cotx} \cdot \text{Cos}^2x$$

14. Si: $\frac{1 + \text{Senx}}{1 - \text{Cosx}} = 2m^2$

Calcula: $E = \text{Cscx} - \text{Cotx}$