



# TRIGONOMETRY

TOMO VIII

**2nd**  
SECONDARY

**Feedback**



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## PROBLEMA 1

Reduzca:  $R = \cot x \cdot \operatorname{sen} x - \frac{1}{\sec x}$

### Resolución:

$$R = \cot x \cdot \operatorname{sen} x - \frac{1}{\sec x}$$

Diagram showing the substitution of trigonometric identities:

$$R = \frac{\cos x}{\cancel{\operatorname{sen} x}} \cdot \cancel{\operatorname{sen} x} - \cos x$$

$$R = \cos x - \cos x$$

$$\therefore R = 0$$



$$\cot x = \frac{\cos x}{\operatorname{sen} x}$$

$$\frac{1}{\sec x} = \cos x$$





## PROBLEMA 2

Reduzca:  $S = \tan^3 x \cdot \cot^2 x \cdot \cos x \cdot \csc x$

### Resolución:

$$S = \tan^3 x \cdot \cot^2 x \cdot \cos x \cdot \csc x$$

$$S = \tan x \cdot \underbrace{\tan^2 x \cdot \cot^2 x}_{(1)} \cdot \cos x \cdot \csc x$$

$$S = \frac{\cancel{\sin x}}{\cancel{\cos x}} \cdot \cancel{\cos x} \cdot \csc x$$

$$S = \sin x \cdot \csc x$$

$$\therefore S = 1$$

$$\tan x \cdot \cot x = 1$$

$$\tan x = \frac{\sin x}{\cos x}$$

$$\sin x \cdot \csc x = 1$$





## PROBLEMA 3

Siendo:  $\cos x + \sec x = \sqrt{5}$

Calcule:  $R = \cos^2 x + \sec^2 x$

### Resolución:

Del dato:

$$\cos x + \sec x = \sqrt{5} \quad ( )^2$$

$$\underbrace{\cos^2 x + \sec^2 x}_R + 2 \cdot \underbrace{\cos x \cdot \sec x}_{(1)} = 5$$

$$R + 2 \cdot (1) = 5$$

$$\therefore R = 3$$

$$(a + b)^2 = a^2 + b^2 + 2ab$$

$$\cos x \cdot \sec x = 1$$





## PROBLEMA 4

Reduzca:  $C = \frac{(\csc x + \cot x)(\csc x - \cot x)}{(\sec x - \tan x)(\sec x + \tan x)}$

### Resolución:

$$C = \frac{(\csc x + \cot x)(\csc x - \cot x)}{(\sec x - \tan x)(\sec x + \tan x)}$$

$$C = \frac{\csc^2 x - \cot^2 x}{\sec^2 x - \tan^2 x}$$

$$C = \frac{1}{1}$$

$$\therefore C = 1$$

$$(a + b)(a - b) = a^2 - b^2$$

$$\csc^2 x - \cot^2 x = 1$$

$$\sec^2 x - \tan^2 x = 1$$





## PROBLEMA 5

Reduzca:  $D = \left( \frac{\text{sen}^3 x}{1 - \cos^2 x} \right) \cdot \csc x$

### Resolución:

$$D = \left( \frac{\text{sen}^3 x}{1 - \cos^2 x} \right) \cdot \csc x$$

$$D = \left( \frac{\text{sen}^3 x}{\text{sen}^2 x} \right) \cdot \csc x$$

$$D = \text{sen} x \cdot \csc x$$

$$\therefore D = 1$$

$$1 - \cos^2 x = \text{sen}^2 x$$

$$\text{sen} x \cdot \csc x = 1$$





## PROBLEMA 6

Reduzca:  $K = \sec x - \operatorname{sen} x \cdot \tan x$

### Resolución:

$$K = \sec x - \operatorname{sen} x \cdot \tan x$$

$$K = \frac{1}{\cos x} - \operatorname{sen} x \cdot \frac{\operatorname{sen} x}{\cos x}$$

$$K = \frac{1 - \operatorname{sen}^2 x}{\cos x}$$

$$K = \frac{\cos^2 x}{\cos x}$$

$$\therefore K = \cos x$$

$$\sec x = \frac{1}{\cos x}$$

$$\tan x = \frac{\operatorname{sen} x}{\cos x}$$

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





## PROBLEMA 7

Reduzca  $L = \frac{1 - \text{sen}x}{\text{cos}x} + \text{tan}x$   
:

**Resolución:**

$$L = \frac{1 - \text{sen}x}{\text{cos}x} + \text{tan}x$$

$$L = \frac{1 - \text{sen}x}{\text{cos}x} + \frac{\text{sen}x}{\text{cos}x}$$

$$L = \frac{1 - \cancel{\text{sen}x} + \cancel{\text{sen}x}}{\text{cos}x}$$

$$\therefore L = \sec x$$



$$\text{tan}x = \frac{\text{sen}x}{\text{cos}x}$$

$$\frac{1}{\text{cos}x} = \sec x$$







## PROBLEMA 8

Si:  $\tan x = \cos x$

Calcule:  $P = 1 + \cos^2 x + \cos^4 x$

### Resolución:

Del dato:

$$\tan x = \cos x$$

$$\frac{\sin x}{\cos x} = \cos x$$

$$\sin x = \cos^2 x \dots ( )^2$$

$$\sin^2 x = \cos^4 x$$

Piden:

$$P = 1 + \cos^2 x + \cos^4 x$$

$$P = 1 + \underbrace{\cos^2 x + \sin^2 x}$$

$$P = 1 + (1)$$

$$\therefore P = 2$$

$$\tan x = \frac{\sin x}{\cos x}$$

$$\sin^2 x + \cos^2 x = 1$$





## PROBLEMA 9

Calcule:  $L = \text{sen}x(\csc x + \text{sen}x) + \cos x(\sec x + \cos x)$

Resolución:

$$L = \text{sen}x(\csc x + \text{sen}x) + \cos x(\sec x + \cos x)$$

$$L = \underbrace{\text{sen}x \cdot \csc x}_{1} + \text{sen}^2 x + \underbrace{\cos x \cdot \sec x}_{1} + \cos^2 x$$

$$L = 1 + \text{sen}^2 x + 1 + \cos^2 x$$

$$L = 2 + \underbrace{\text{sen}^2 x + \cos^2 x}_{1}$$

$$\therefore L = 3$$

$$\text{sen}x \cdot \csc x = 1$$

$$\cos x \cdot \sec x = 1$$

$$\text{sen}^2 x + \cos^2 x = 1$$





## PROBLEMA 10

Si:  $\sec x + \tan x = 3$

Calcule:  $\sec x$

### Resolución:

Recordar:

$$\sec^2 x - \tan^2 x = 1$$

$$\underbrace{(\sec x + \tan x)}_3 (\sec x - \tan x) = 1$$

$$\sec x - \tan x = \frac{1}{3}$$

$$a^2 - b^2 = (a + b)(a - b)$$

$$\begin{array}{r} \cancel{\sec x + \tan x} = 3 \\ \cancel{\sec x - \tan x} = \frac{1}{3} \end{array} \quad \begin{array}{c} \downarrow + \\ \hline \end{array}$$

$$2\sec x = 3 + \frac{1}{3}$$

$$2\sec x = \frac{10}{3}$$

$$\therefore \sec x = \frac{5}{3}$$

