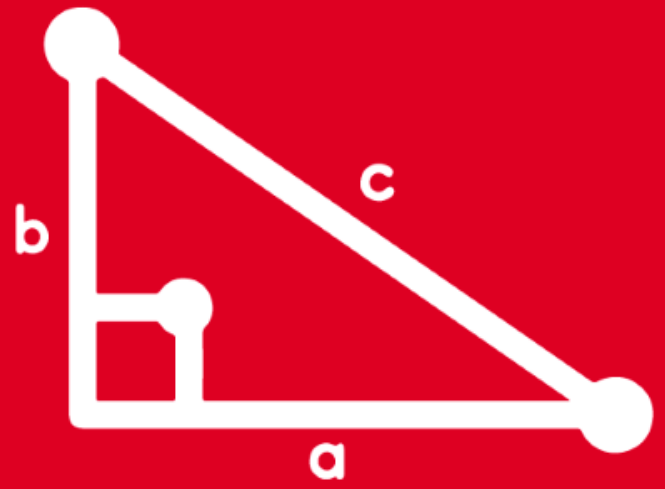
TRIGONOMETRY

VOLUME VIII

2nd
SECONDARY



FEEDBACK

SACO OLIVEROS

PROBLEMA 1

Reduzca $\mathbf{R = cotx \cdot senx - \frac{1}{secx}}$

Resolución

$$R = \mathbf{cotx} \cdot senx - \frac{\mathbf{1}}{\mathbf{secx}}$$

$$R = \frac{\mathbf{cosx}}{\cancel{\mathbf{senx}}} \cdot \cancel{senx} - \mathbf{cosx}$$

$$R = cosx - cosx$$

$$\therefore \mathbf{R = 0}$$

$$\mathbf{cotx = \frac{cosx}{senx}}$$

$$\mathbf{\frac{1}{secx} = cosx}$$

PROBLEMA 2

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

Resolución

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

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

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

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

$$\therefore S = 1$$

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

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

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

PROBLEMA 3

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

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

Resolución

Del dato:

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

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

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

$$\therefore R = 3$$

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

$$\cos x.\sec x = 1$$

PROBLEMA 4

Reduzca $C = \dfrac{(\mathbf{cscx + cotx})(\mathbf{cscx - cotx})}{(\mathbf{secx - tanx})(\mathbf{secx + tanx})}$

Resolución

$$C = \frac{(cscx + cotx)(cscx - cotx)}{(secx - tanx)(secx + tanx)}$$

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

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

$$\therefore \mathbf{C = 1}$$

$$\mathbf{(a+b)(a-b) = a^2 - b^2}$$

$$\mathbf{csc^2x - cot^2x = 1}$$

$$\mathbf{sec^2x - tan^2x = 1}$$

PROBLEMA 5

Reduzca $D = \left(\frac{\mathbf{sen^3 x}}{\mathbf{1 - cos^2 x}}\right).\mathbf{cscx}$

Resolución

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

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

$$D = \text{senx} \cdot \text{cscx}$$

$$\therefore D = 1$$

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

$$\text{senx}.\,\text{cscx} = 1$$

PROBLEMA 6

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

Resolución

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

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

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

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

$$\therefore K = \cos x$$

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

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

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

PROBLEMA 7

Reduzca $L = \dfrac{1 - \text{senx}}{\text{cosx}} + \text{tanx}.$

Resolución

$$L = \frac{1-\text{senx}}{\text{cosx}} + \textbf{tanx}$$

$$L = \frac{1 - \text{senx}}{\text{cosx}} + \frac{\textbf{senx}}{\textbf{cosx}}$$

$$L = \frac{1 - \cancel{\text{senx}} + \cancel{\text{senx}}}{\text{cosx}}$$

$$\therefore L = \text{secx}$$

$$\textbf{tanx} = \frac{\textbf{senx}}{\textbf{cosx}}$$

$$\frac{1}{\textbf{cosx}} = \textbf{secx}$$

PROBLEMA 8

Si $\tan x = \cos x$, calcule

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

Resolución

Del dato:

$$\tan x = \cos x$$

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

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

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

Calculamos:

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

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

$$P = 1 + (1)$$

$$\therefore P = 2$$

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

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

PROBLEMA 9

Calcule $L = senx(cscx + senx) + cosx(secx + cosx)$.

Resolución

$$L = senx(cscx + senx) + cosx(secx + cosx)$$

$$L = \underbrace{senx.\,cscx}_{1} + sen^2x + \underbrace{cosx.\,secx}_{1} + cos^2x$$

$$L = 1 + sen^2x + 1 + cos^2x$$

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

$$\therefore L = 3$$

$$senx.\,cscx = 1$$

$$cosx.\,secx = 1$$

$$sen^2x + cos^2x = 1$$

PROBLEMA 10

Si se cumple que $\sec x + \tan x = 3$, calcule $\sec x$.

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

Resolución

Recordar:

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

$$\underbrace{(\sec x + \tan x)}_{3}(\sec x - \tan x) = 1$$

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

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

$$\sec x - \tan x = \frac{1}{3} \quad \Big| + \downarrow$$

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

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

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


SACO
OLIVEROS