PROBLEMA 1

Reduzca: $R = \cot x . \operatorname{sen} x - \dfrac{1}{\sec x}$

Resolución:

$R = \mathbf{\cot x} . \operatorname{sen} x - \dfrac{1}{\mathbf{\sec x}}$

$R = \dfrac{\mathbf{\cos x}}{\mathbf{\operatorname{sen} x}} . \operatorname{sen} x - \mathbf{\cos x}$

$R = \cos x - \cos x$

$\therefore R = 0$

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

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

PROBLEMA 2

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

Resolución:

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

$S = \mathbf{tanx.} \, \mathbf{tan^2 x} . \cot^2 x . \cos x . \csc x$

(1)

$S = \dfrac{\mathbf{senx}}{\mathbf{cosx}} . \cos x . \csc x$

$S = \; \text{senx} . \csc x$

$\therefore \, \mathbf{S = 1}$

$\boxed{\tan x . \cot x = 1}$

$\boxed{\tan x = \dfrac{\mathbf{senx}}{\mathbf{cosx}}}$

$\boxed{\text{senx} . \csc x = 1}$

PROBLEMA 3

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

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

Resolución:

Del dato:

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

$$\underbrace{\cos^2 x + \sec^2 x}_{} + \underbrace{2.\cos x.\sec x}_{} = 5$$

$$R \quad + 2 . \quad (1) \quad = 5$$

$$\therefore R = 3$$

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

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

PROBLEMA 4

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

Resolución:

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

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

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

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

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

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

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

PROBLEMA 5

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

Resolución:

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

$$D = \left(\dfrac{sen^3x}{sen^2x}\right). cscx$$

$$D = \; senx. cscx$$

$$\therefore D = 1$$

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

$$senx. cscx = 1$$

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PROBLEMA 6

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

Resolución:

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

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

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

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

$$\therefore K = \cos x$$

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

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

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

PROBLEMA 7

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

Resolución:

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

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

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

$$\therefore L = \sec x$$

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

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

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PROBLEMA 8

Si: $\tan x = \cos x$

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

Resolución:

Del dato:

$$\tan x = \cos x$$

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

$$\operatorname{sen} x = \cos^2 x \qquad (\quad)^2$$

$$\operatorname{sen}^2 x = \cos^4 x$$

Calculamos:

$$P = 1 + \cos^2 x + \mathbf{\cos^4 x}$$

$$P = 1 + \cos^2 x + \mathbf{\operatorname{sen}^2 x}$$

$$P = 1 + \quad (\mathbf{1})$$

$$\therefore P = 2$$

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

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

PROBLEMA 9

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

Resolución:

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

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

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

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

$$\therefore L = 3$$

$senx.cscx = 1$

$cosx.secx = 1$

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

PROBLEMA 10

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

Calcule: $\sec x$

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

Resolución:

Recordar:

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

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

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

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

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

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

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

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