



## Recíprocas:

$$\operatorname{sen} \alpha \cdot \operatorname{csc} \alpha = 1$$

$$\operatorname{cos} \alpha \cdot \operatorname{sec} \alpha = 1$$

$$\operatorname{tg} \alpha \cdot \operatorname{ctg} \alpha = 1$$

## Complementarias

$$\operatorname{sen} \alpha = \operatorname{cos} \theta$$

$$\operatorname{tg} \alpha = \operatorname{ctg} \theta$$

$$\operatorname{sec} \alpha = \operatorname{csc} \theta$$

$$\left. \begin{array}{l} \nearrow \alpha + \theta \\ \searrow \end{array} \right\} = 90$$

<https://view.genial.ly/60b8412aca42f20da03cdea3/presentation-razones-trigonometricas>

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$$\text{Si: } \frac{\operatorname{sen}(2x+25)}{\operatorname{cos}(x+5)} \cdot \frac{\operatorname{cos} 56}{\operatorname{sen} 34} = \sqrt{(\sqrt{3})^2 - 2}$$

$\downarrow$   
1

$$\begin{aligned} 2x+25 + x+5 &= 90 \\ 3x &= 60 \\ x &= 20 \end{aligned}$$

$$\left[ \operatorname{cos}(2x+10) - \operatorname{sen} 2x + 2 \right] \cdot \frac{\sqrt{3}}{2}$$

$$\left( \cancel{\operatorname{cos} 50} - \cancel{\operatorname{sen} 40} + 2 \right) \cdot \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

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Halla  $(x+y+z)$ ; si:  $x, y, z$  son agudos

$$\operatorname{sen}(x+60) = \operatorname{cos}(y-37)$$

$$\operatorname{tg}(45+x) = \operatorname{cot}(z-37)$$

$$\operatorname{sec}(z+30) = \operatorname{csc}(y-15)$$

$$\begin{array}{l} x+60 + y-37 = 90 \\ x+y = 67 \end{array}$$

$$\begin{array}{l} 45+x + z-37 = 90 \\ x+z = 82 \end{array}$$

$$\begin{array}{l} z+30 + y-15 = 90 \\ z+y = 75 \end{array}$$

$$\begin{array}{l} x+y = 67 \\ x+z = 82 \\ z+y = 75 \end{array}$$

$$2x+2y+2z = 224$$

$$= 112$$

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Si se cumple  $\operatorname{sen}(2a+b) = \cos(a+2b)$

Calcula:  $P = \frac{\operatorname{sen} 3a}{\cos 3b} + \frac{\operatorname{sen} 3b}{\cos 3a}$

$$2a + b + a + 2b = 90$$

$$3a + 3b = 90$$

$$/ \quad P = 1 + 1$$

$$= 2$$

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Si:  $\operatorname{sen} 2x = \cos 5x$ , calcula:

$$E = \tan 3x \cdot \tan 4x + \operatorname{sen} x \cdot \sec 6x$$

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Sol:

$$\bullet \operatorname{sen}(3x-20) - \cos(6x+20) = 0$$

$$\bullet \operatorname{tg}(2y) \cdot \operatorname{ctg}(80) - 1 = 0$$

Calcula:

$$\begin{array}{l} x+y \\ \swarrow \searrow \\ \textcircled{50} \end{array}$$

$$\operatorname{sen}(3x-20) = \cos(6x+20)$$

$$3x-20+6x+20=90$$

$$9x=90$$

$$\textcircled{x=10}$$

$$\operatorname{tg}(2y) \cdot \operatorname{ctg}(80) = 1$$

$$2y=80$$

$$\textcircled{y=40}$$

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Calcula

$$C = \operatorname{sen} 20 \cdot \sec 70 + 2 \cos 10 \cdot \csc 80 + 3 \operatorname{tg} 40 \cdot \operatorname{tg} 50$$

$$\cancel{\cos 70} \cdot \cancel{\sec 70} + 2 \cancel{\operatorname{sen} 80} \cdot \cancel{\csc 80} + 3 \cancel{\operatorname{ctg} 50} \cdot \cancel{\operatorname{tg} 50}$$

$$1 + 2 + 3$$

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Se:

$$\operatorname{sen}(2x + y) \operatorname{csc}(2y + 30) = 1$$

$$\tan(x + 30) = \cot(y + 30)$$

CALCULA:  $3x - 2y$ .

$$2x + y = 2y + 30$$

$$2x = y + 30$$

$$2x = 30 - x + 30$$

$$3x = 60$$

$$x = 20$$

$$x + 60 + y = 90$$

$$x + y = 30$$

$$y = 30 - x$$

$$3x - 2y$$

$$3(20) - 2(10)$$

$$60 - 20$$

$$\rightarrow 40$$

$$2(20) + y = 2y + 30$$

$$40 - 30 = 2y - y$$

$$10 = y$$