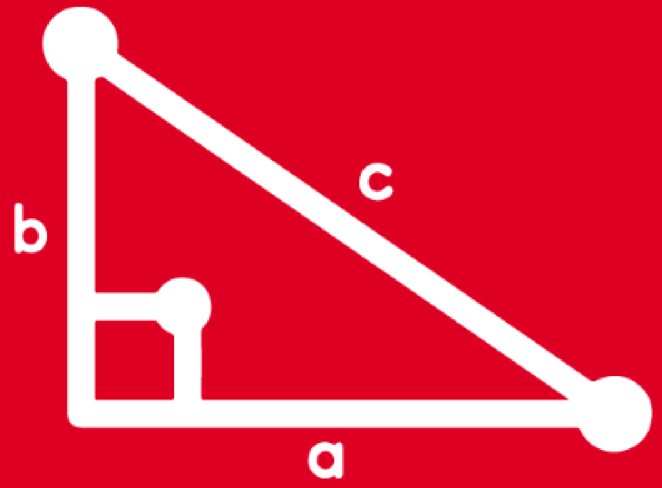
TRIGONOMETRY

TOMO VII

2nd
SECONDARY



FEEDBACK

SACO OLIVEROS

PROBLEMA 1

Indique cuáles de los siguientes pares de ángulos son coterminales.

I. 475° y – 245°
II. 180° y – 170°
III. 390° y 30°

Resolución:

I. $475° - (-245°) = 475° + 245° = 720°$

Si son ángulos coterminales

II. $180° - (-170°) = 180° + 170° = 350°$

No son ángulos coterminales

III. $390° - 30° = 360°$

Si son ángulos coterminales

$\boxed{I\ y\ III\ son\ coterminales}$

PROBLEMA 2

Si los ángulos ω y β son las medidas de dos ángulos coterminales, reduzca:

$$S = \frac{3\cos\omega}{2\cos\beta} + 2\tan\omega.\cot\beta$$

Para dos ángulos coterminales cuyas medidas son θ y α se cumple:

$$\boxed{R.T.(\theta) = R.T.(\alpha)}$$

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

Resolución:

Como ω y β son coterminales, se cumple:

$$\boxed{\cos\beta = \cos\omega} \qquad \boxed{\cot\beta = \cot\omega}$$

Reemplazando:

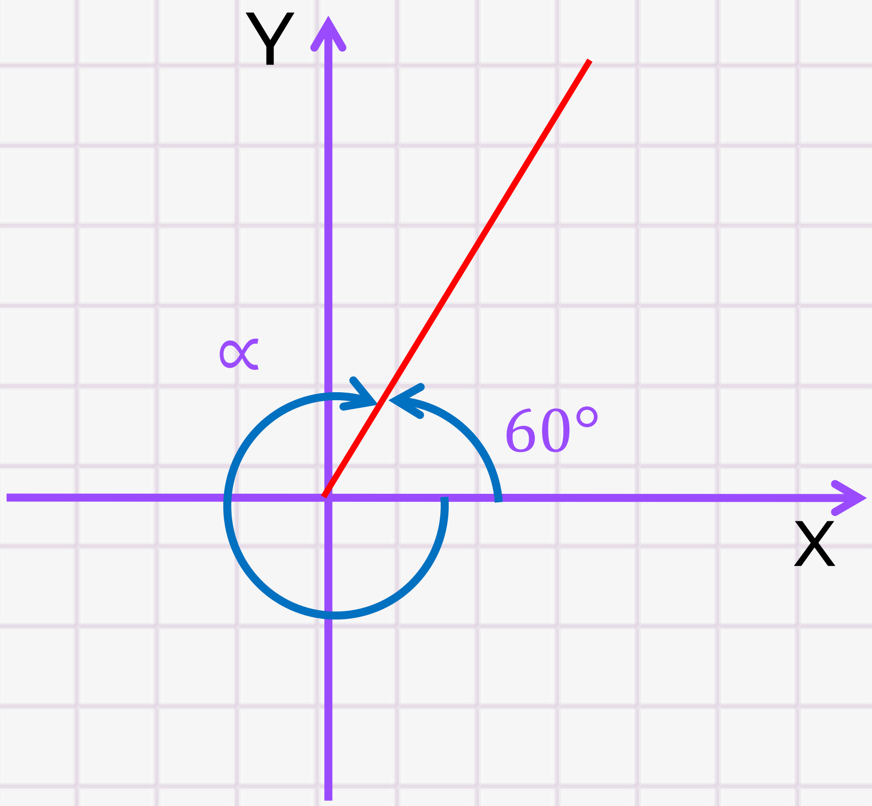
$$S = \frac{3\cancel{\cos\omega}}{2\cancel{\cos\omega}} + 2\underbrace{\tan\omega.\cot\omega}_{1}$$

$$S = \frac{3}{2} + 2$$

$$\boxed{S = \frac{7}{2}}$$

PROBLEMA 3

Del gráfico:

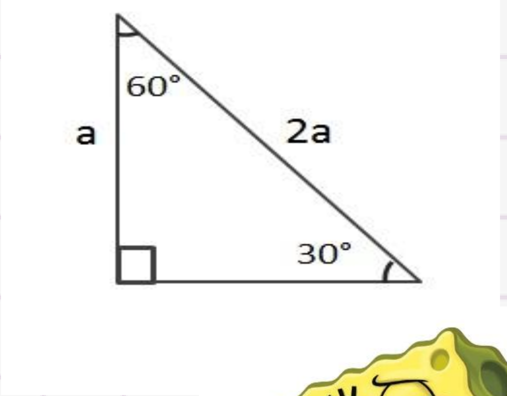


Efectúe: $M = 4\text{sen}^2 \propto - \sec \propto$

Resolución:

Del gráfico, $\propto$ y $60°$ son las medidas de dos ángulos coterminales, por lo tanto:

$\boxed{\textbf{sen} \propto = \textbf{\textit{sen}}\mathbf{60°}}$ $\boxed{\textbf{sec} \propto = \textbf{\textit{sec}}\mathbf{60°}}$



Reemplazando:

$$M = 4\ \textbf{\textit{sen}}^{\mathbf{2}}\mathbf{60} - \mathbf{sec60°}$$

$$M = 4\left(\frac{\sqrt{3}}{2}\right)^2 - \ 2$$

$$M = \cancel{4}\left(\frac{3}{\cancel{4}}\right) - 2$$

$\boxed{M = 1}$

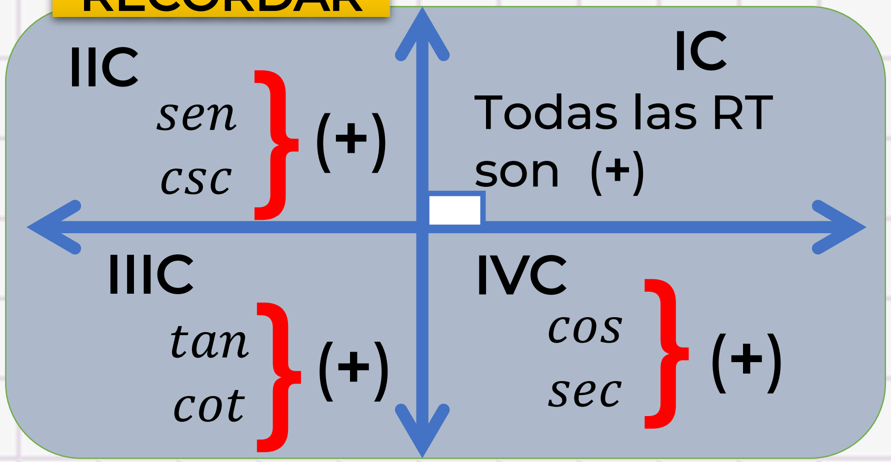
PROBLEMA 4

Reducir al primer cuadrante:

$a.\cos(90° + \propto)$ $\qquad b.\,tan(270° - \propto)$

$c.\,sec(360° - \propto)$

RECORDAR



$$\boldsymbol{RT\left(\begin{matrix}180°\\360°\end{matrix} \pm \alpha\right) = \pm\, RT(\alpha)}$$

$$\boldsymbol{RT\left(\begin{matrix}90°\\270°\end{matrix} \pm \alpha\right) = \pm CO - RT(\alpha)}$$

Resolución:

$$\text{a. } \underbrace{\cos(90° + \propto)}_{\textbf{IIC}} = -\ \text{sen}\alpha$$

$$\text{b. } \underbrace{\tan(270° - \propto)}_{\textbf{IIIC}} = +\ \cot\alpha$$

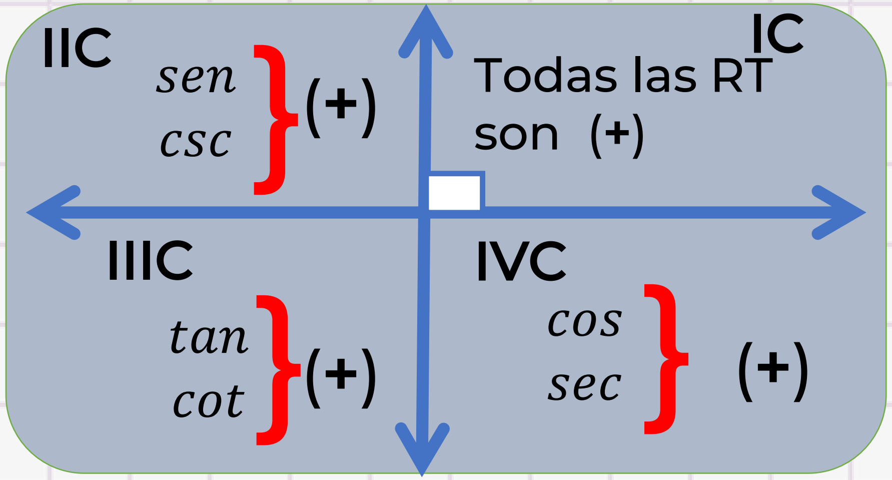
$$\text{c. } \underbrace{\sec(360° - \propto)}_{\textbf{IVC}} = +\ \sec\alpha$$

PROBLEMA 5

Reducir:

$$K = 5sen(90° + x) - 2\cos(180° + x)$$

RECORDAR



$$RT\left(\begin{matrix}180°\\360°\end{matrix} \pm \alpha\right) = \pm RT(\alpha)$$

$$RT\left(\begin{matrix}90°\\270°\end{matrix} \pm \alpha\right) = \pm CO - RT(\alpha)$$

Resolución:

$$K = 5\underbrace{\mathbf{sen}(\mathbf{90° + x})}_{IIC} - 2\cos\underbrace{(\mathbf{180° + x})}_{IIIC}$$

$$K = 5.\ (\mathbf{cosx})\ -2\ (\mathbf{-cosx})$$

$$K = 5\text{cosx} + 2\text{cosx}$$

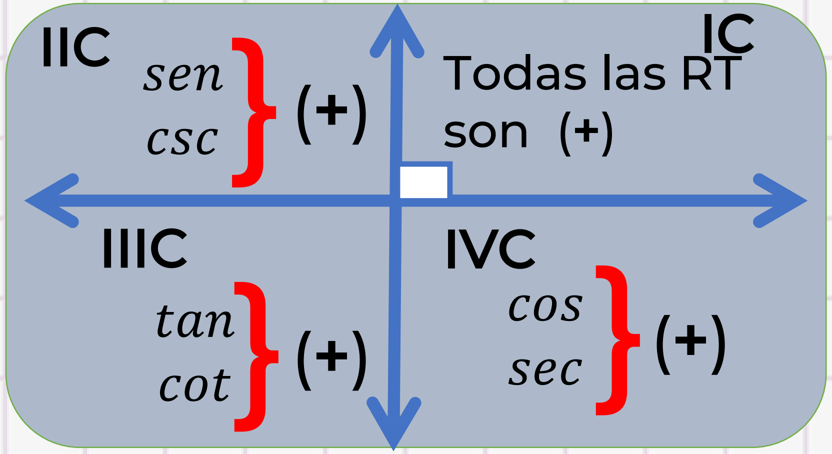
$$\boxed{\mathbf{K = 7cosx}}$$

PROBLEMA 6

Reducir:

$$P = \frac{\tan(180° + x).\sec(90° + x)}{\tan x.\csc(360° - x)}$$

RECORDAR



$$RT\left(\begin{matrix}180°\\360°\end{matrix} \pm \alpha\right) = \pm RT(\alpha)$$

$$RT\left(\begin{matrix}90°\\270°\end{matrix} \pm \alpha\right) = \pm CO - RT(\alpha)$$

Resolución:

$$P = \frac{\tan\overbrace{(180° + x)}^{IIIC}.\sec\overbrace{(90° + x)}^{IIC}}{\tan x.\csc\underbrace{(360° - x)}_{IVC}}$$

$$P = \frac{\cancel{(\tan x)}\ \cancel{(-\csc x)}}{\cancel{(\tan x)}\ \cancel{(-\csc x)}}$$

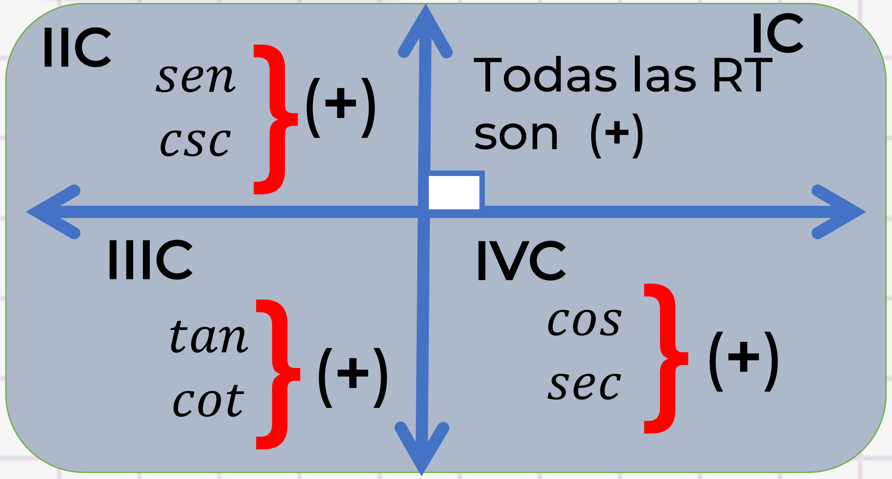
$$\boxed{P = 1}$$

PROBLEMA 7

Calcular:

$$D = \frac{tan225°}{sen330°}$$

RECORDAR



$$RT\left(\begin{matrix}180°\\360°\end{matrix} \pm \alpha\right) = \pm RT(\alpha)$$

Resolución:

$$\tan225° = \tan\underbrace{(180° + 45°)}_{\text{IIIC}}$$

$$\tan225° = \tan45°$$

$$\text{sen}330° = \text{sen}\underbrace{(360° - 30°)}_{\text{IVC}}$$

$$\text{sen}330° = -\text{sen}30°$$

Reemplazando:

$$D = \frac{\tan45°}{-\text{sen}30°}$$

$$D = \frac{1}{-\frac{1}{2}}$$

$$\boxed{D = -2}$$

PROBLEMA 8

Calcular:

$$L = \frac{\cos 233°.\csc^2 120°}{\tan 315}$$

RECORDAR

IIC: sen, csc } (+)

IC: Todas las RT son (+)

IIIC: tan, cot } (+)

IVC: cos, sec } (+)

$$RT\left(\begin{matrix}180°\\360°\end{matrix} \pm \alpha\right) = \pm RT(\alpha)$$

Resolución:

$$L = \frac{\cos\underbrace{(180° + 53°)}_{\text{IIIC}}.\csc^2\underbrace{(180° - 60°)}_{\text{IIC}}}{\tan\underbrace{(360° - 45°)}_{\text{IVC}}}$$

$$L = \frac{(\cancel{-}\cos 53°)\ (\csc^2 60°)}{(\cancel{-}\tan 45°)}$$

$$L = \frac{\left(\frac{3}{5}\right)\left(\frac{2}{\sqrt{3}}\right)^2}{(1)}$$

$$L = \left(\frac{\cancel{3}}{5}\right)\left(\frac{4}{\cancel{3}}\right)$$

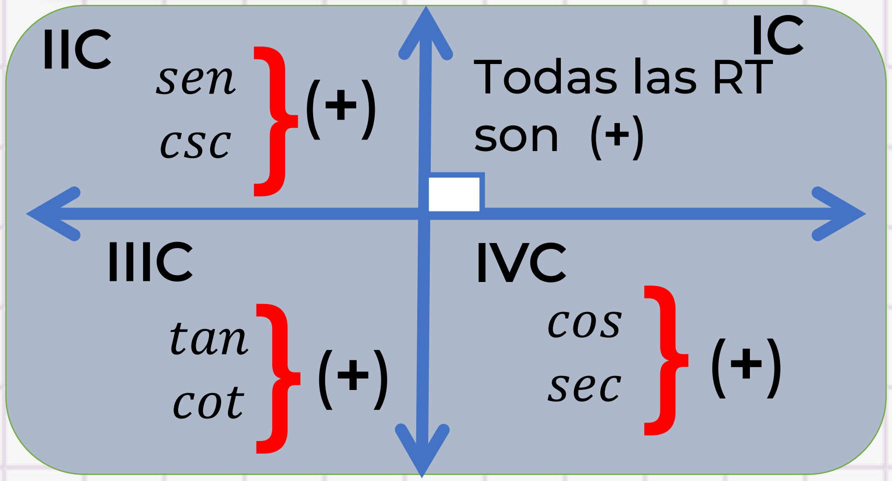
$$\boxed{L = \frac{4}{5}}$$

PROBLEMA 9

Calcular:

$$M = cos20° + cos80° + cos100° + cos160°$$

RECORDAR



$$RT\left(\begin{matrix}180°\\360°\end{matrix} \pm \alpha\right) = \pm RT(\alpha)$$

Resolución:

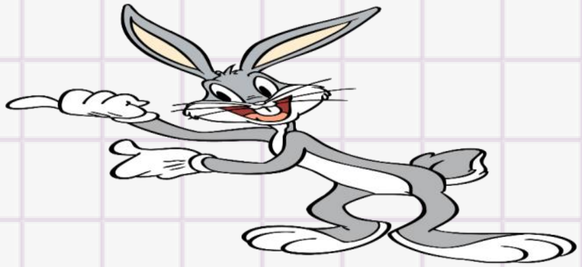
$$M = cos20° + cos80° + \mathbf{cos100°} + \mathbf{cos160°}$$

$$\mathbf{cos100°} = \underbrace{\cos(180° - 80°)}_{\mathbf{IIC}} = -\mathbf{cos80°}$$

$$\mathbf{cos160°} = \underbrace{\cos(180° - 20°)}_{\mathbf{IIC}} = -\mathbf{cos20°}$$

Reemplazamos:

$$M = \cancel{cos20°} + \cancel{cos80°} + (\cancel{-\mathbf{cos80°}}) + (\cancel{-\mathbf{cos20°}})$$



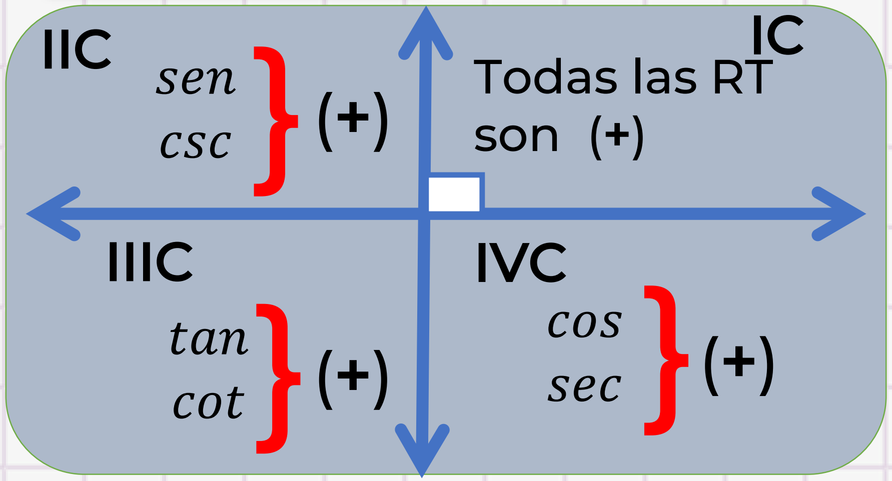
$$\boxed{\mathbf{M = 0}}$$

PROBLEMA 10

El gasto diario de Luis en pasajes es “B” soles. ¿Cuál será el gasto total a la semana?

$$B = 5\operatorname{sen}143° - \sqrt{3}.\cot 300°$$

RECORDAR



$$RT\begin{pmatrix}180° \\ 360°\end{pmatrix} \pm \alpha) = \pm RT(\alpha)$$

Resolución:

Resolvemos:

$$B = 5\mathbf{sen143°} - \sqrt{3}.\mathbf{cot300°}$$

$$\mathbf{sen143°} = \mathbf{sen}\underbrace{(\mathbf{180° - 37°})}_{\mathbf{IIC}} = +\mathbf{sen37°}$$

$$\mathbf{cot300°} = \mathbf{cot}\underbrace{(\mathbf{360° - 60°})}_{\mathbf{IVC}} = -\mathbf{cot60°}$$

Reemplazamos: $B = 5\mathbf{sen37°} - \sqrt{3}.(\mathbf{-cot60°})$

$$B = \cancel{5}\left(\frac{3}{\cancel{5}}\right) - \cancel{\sqrt{3}}.\left(-\frac{1}{\cancel{\sqrt{3}}}\right) \quad \boxed{\mathbf{B = 4}}$$

∴ Luis gasta 28 soles a la semana

SACO
OLIVEROS