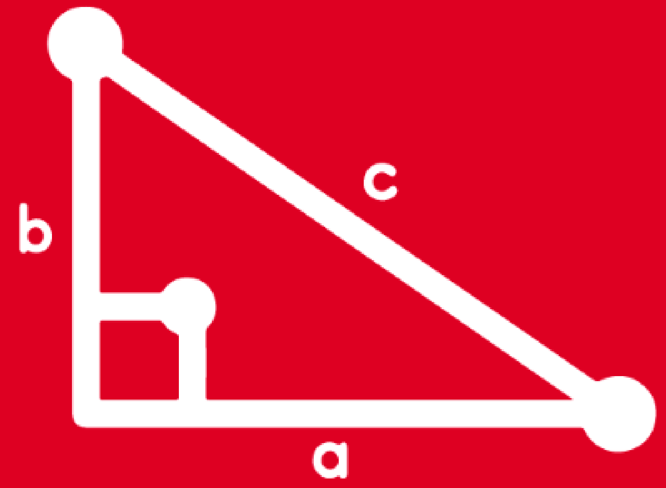
TRIGONOMETRY

TOMO VII



2nd
SECONDARY

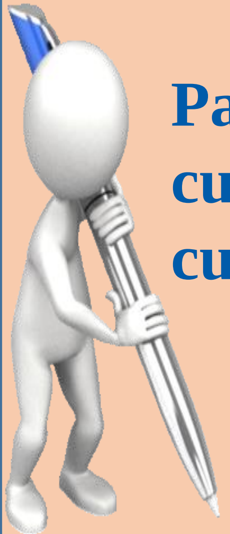
Feedback

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°



Para dos ángulos coterminales cuyas medidas son x e y, se cumple:

$$\boxed{x - y = 360°\, n;\ n \in \mathbb{Z}}$$

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:

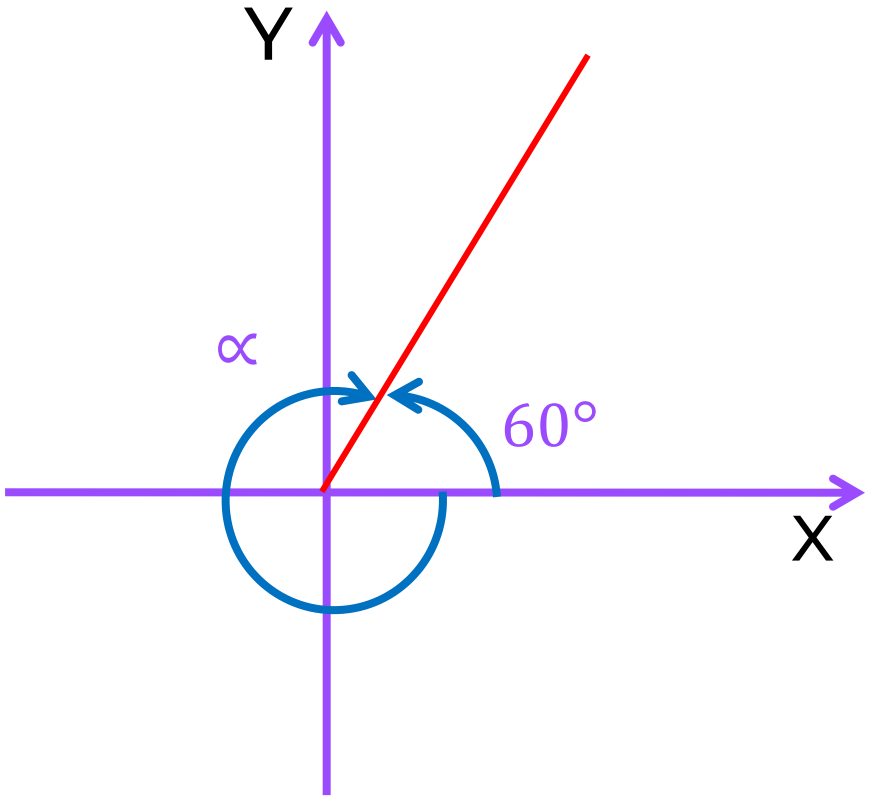
$$S = \frac{3\cancel{\cos\omega}}{2\cancel{\cos\omega}} + 2\underbrace{\tan\omega . \cot\omega}_{1}$$

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

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

PROBLEMA 3

Del gráfico:



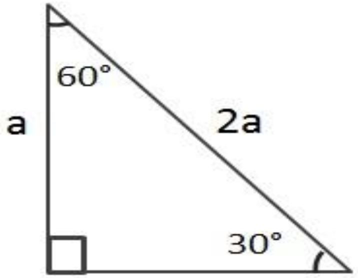
Efectúe: $M = 4\text{sen}^2 \propto - \sec \propto$

Resolución:

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

$\boxed{\text{sen} \propto = sen60°}$ $\boxed{\sec \propto = sec60°}$

Reemplazando:



$$M = 4\; sen^2 60 - sec60°$$

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

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

$$\boxed{M = 1}$$

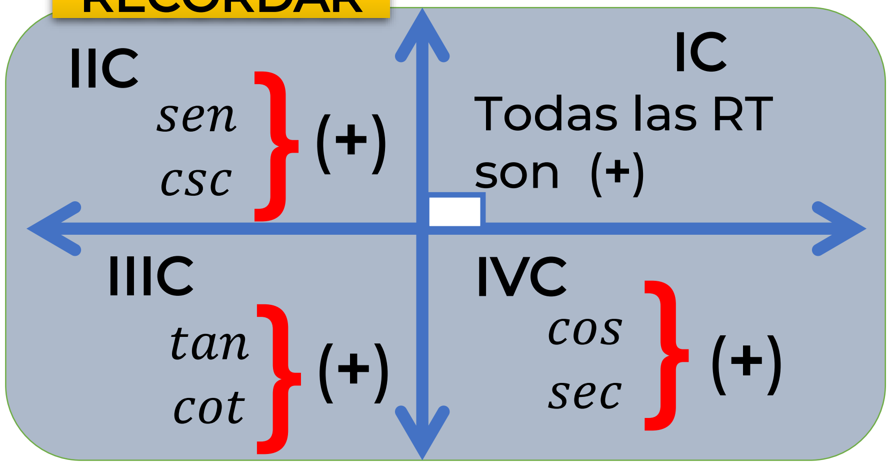
PROBLEMA 4

Reducir al primer cuadrante:

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

$c.\ sec(360° - \propto)$

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:

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

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

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

PROBLEMA 5

Reducir:

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

RECORDAR

IIC: sen, csc (+)

IC: Todas las RT son (+)

IIIC: tan, cot (+)

IVC: cos, sec (+)

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

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

Resolución:

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

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

$$K = 5cosx + 2cosx$$

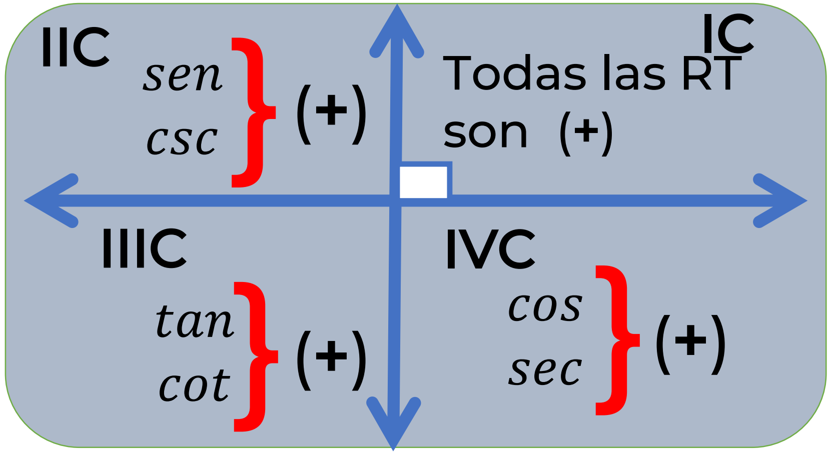
$$\boxed{\mathbf{K = 7cosx}}$$

PROBLEMA 6

Reducir:

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

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:

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

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

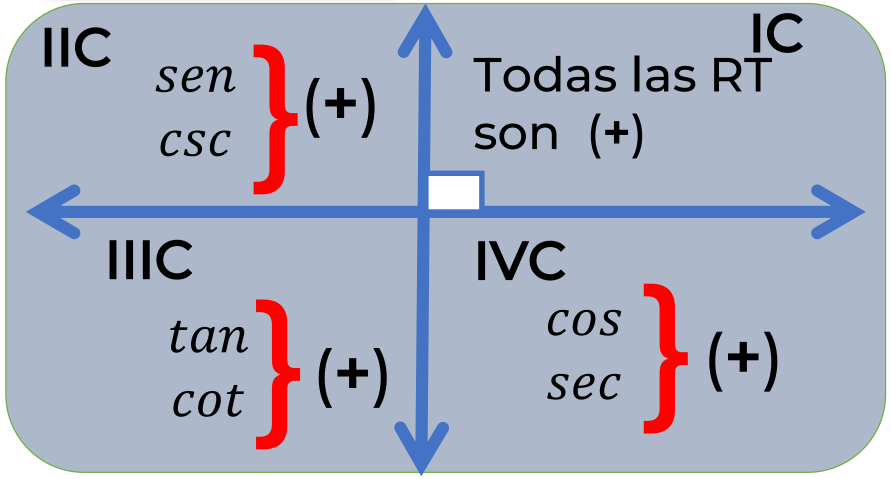
$$\boxed{P = 1}$$

PROBLEMA 7

Calcular:

$$D = \frac{tan225°}{sen330°}$$

RECORDAR



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

Resolución:

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

$$\mathbf{tan225° = } \ \boldsymbol{tan45°}$$

$$\mathbf{sen330° = sen\underbrace{(360° - 30°)}_{IVC}}$$

$$\mathbf{sen330° = -sen30°}$$

Reemplazando:

$$D = \frac{\mathbf{tan45°}}{\mathbf{-sen30°}}$$

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

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

PROBLEMA 8

Calcular:

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

RECORDAR

IIC $\left.\begin{matrix} sen \\ csc \end{matrix}\right\}$ (+)

IC Todas las RT son (+)

IIIC $\left.\begin{matrix} tan \\ cot \end{matrix}\right\}$ (+)

IVC $\left.\begin{matrix} cos \\ sec \end{matrix}\right\}$ (+)

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

Resolución:

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

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

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

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

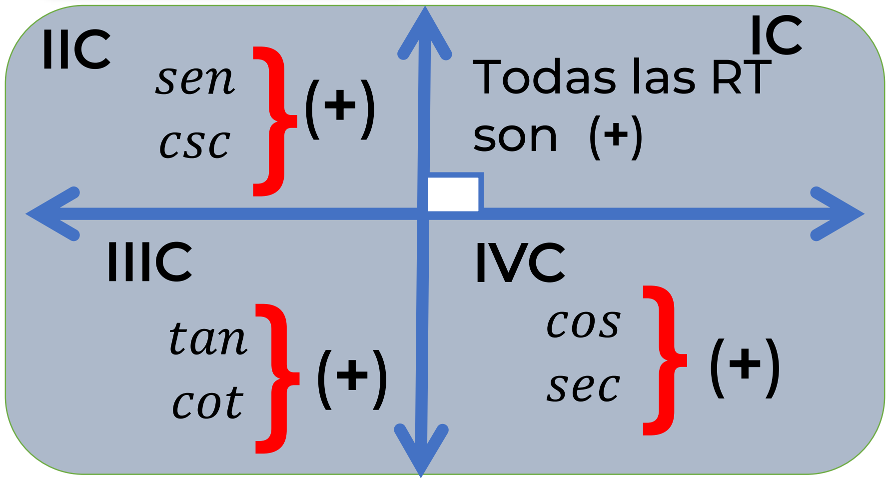
$$\boxed{L = \frac{4}{5}}$$

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:

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

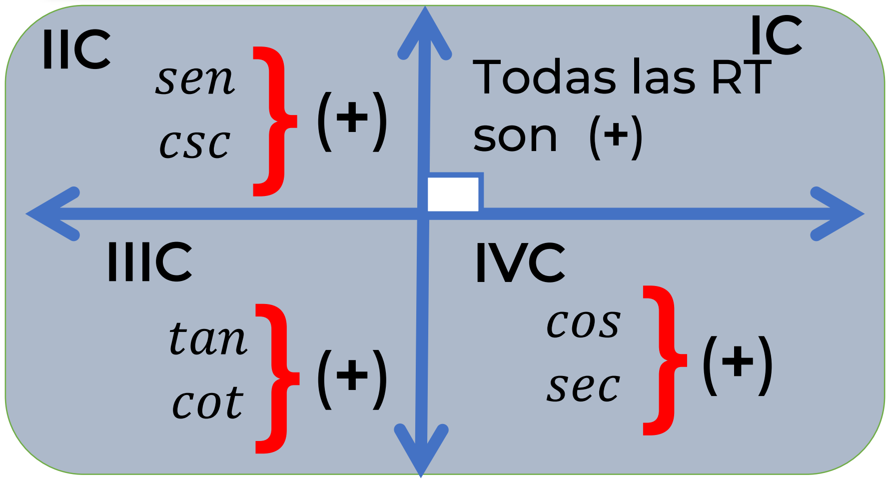
$$\boxed{\mathbf{M = 0}}$$

PROBLEMA 10

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

$$B = 5\text{sen}143° - \sqrt{3}.\cot300°$$

RECORDAR



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

Resolución:

Resolvemos:

$$B = 5\text{sen}143° - \sqrt{3}.\cot300°$$

$$\text{sen}143° = \underbrace{\text{sen}(180° - 37°)}_{\text{IIC}} = +\text{sen}37°$$

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

Reemplazamos : $B = 5\text{sen}37° - \sqrt{3}.(-\cot60°)$

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

∴ Luis gasta 28 soles a la semana