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:

$$x - y = 360° \, n; \, n \, \epsilon \, Z$$

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

I y III son coterminales

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PROBLEMA 2

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

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

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

$$R.T.(\theta) = R.T.(\alpha)$$

$$tanx.cotx = 1$$

Resolución:

Como ω y β son coterminales, se cumple:

$$cos\beta = cos\omega$$

$$cot\beta = cot\omega$$

Reemplazando:

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

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

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

PROBLEMA 3

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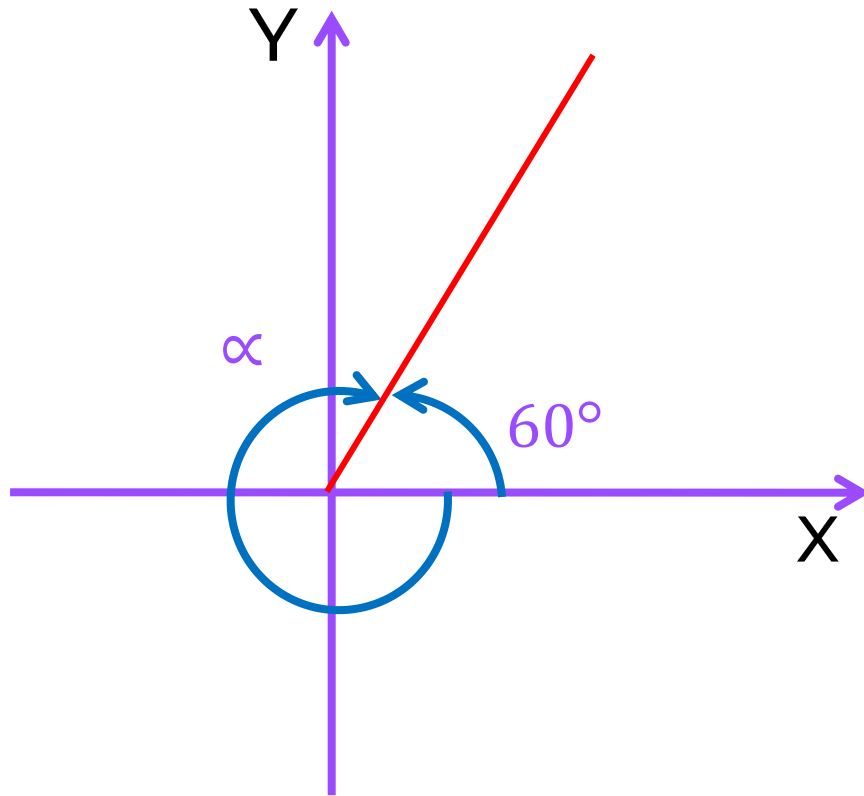
Efectúe: $M = 4\text{sen}^2 \propto -\sec \propto$

Resolución:

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

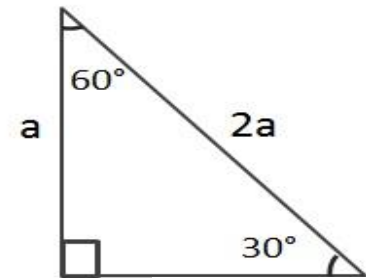$$\text{sen} \propto = sen60°$$

$$\sec \propto = sec60°$$

Reemplazando:

$$M = 4 \, sen^2 60 - \sec60°$$

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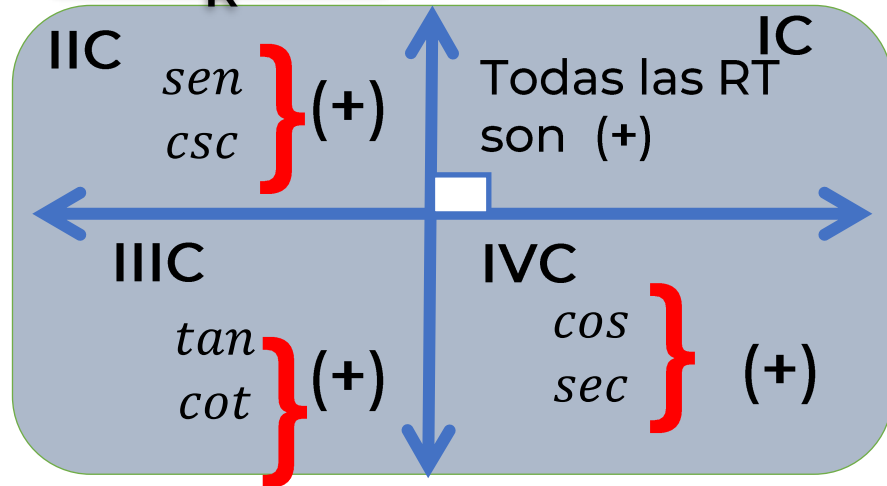
$$M = 4 \left(\frac{3}{4}\right) - 2$$

$$M = 1$$

PROBLEMA 4

Reducir al primer cuadrante:

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

$$c. \sec(360° - \propto)$$

RECORDAR

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

IC
Todas las RT
son (+)

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

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

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

$$RT\begin{pmatrix} \mathbf{90°} \\ \mathbf{270°} \end{pmatrix} \pm \boldsymbol{\alpha}\big) = \pm CO - RT(\boldsymbol{\alpha})$$

Resolución:

$$a. \cos(\underline{90° + \propto}) = \; - \; senx$$

IIC

$$b. \tan(\underline{270° - \propto}) = \; + \; cot\alpha$$

IIIC

$$c. \sec(\underline{360° - \propto}) = \; + \; sec\alpha$$

IVC

PROBLEMA 5

Reducir:

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

RECORDAR

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

IC
Todas las RT son (+)

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

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

$$RT\left(\begin{array}{l} \mathbf{180°} \\ \mathbf{360°} \end{array} \pm \boldsymbol{\alpha}\right) = \pm RT(\boldsymbol{\alpha})$$

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

Resolución:

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

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

$$K = 5\cos x + 2\cos x$$

$$\boxed{K = 7\cos x}$$

PROBLEMA 6

Reducir:

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

RECORDAR

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

IC
Todas las RT
son (+)

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

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

$$RT\left(\begin{array}{c}\mathbf{180°}\\\mathbf{360°}\end{array}\pm\alpha\right) = \pm RT(\alpha)$$
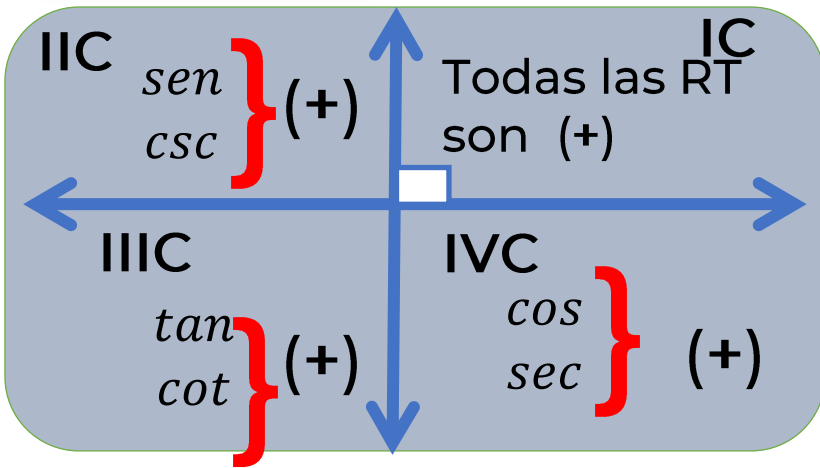
$$RT\left(\begin{array}{c}\mathbf{90°}\\\mathbf{270°}\end{array}\pm\alpha\right) = \pm CO-RT(\alpha)$$

Resolución:

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

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

$$\boxed{P = 1}$$

PROBLEMA 7

Calcular:

$$D = \frac{tan225°}{sen330°}$$
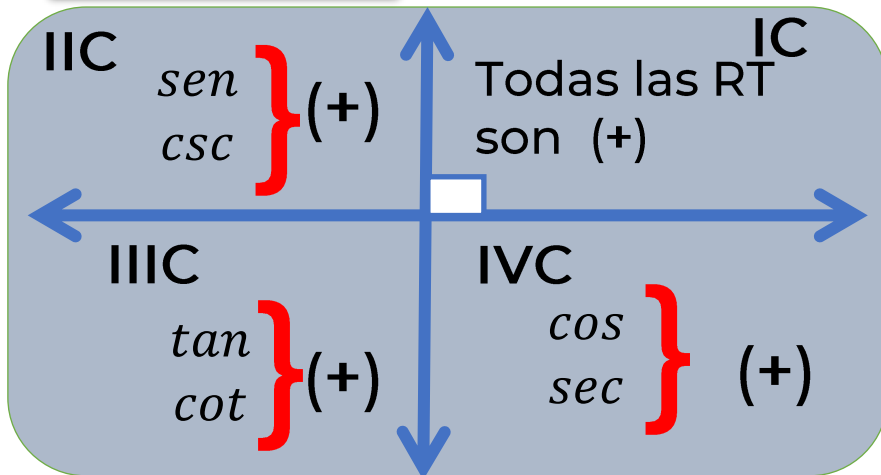
RECORDAR

IIC
$\left.\begin{array}{c} sen \\ csc \end{array}\right\}$ **(+)**

IC
Todas las RT son (+)

IIIC
$\left.\begin{array}{c} tan \\ cot \end{array}\right\}$ **(+)**

IVC
$\left.\begin{array}{c} cos \\ sec \end{array}\right\}$ **(+)**

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

Resolución:

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

$$\mathbf{tan225° = \ tan45°}$$

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

$$\mathbf{sen330° = -sen30°}$$

Reemplazando:

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

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

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

PROBLEMA 8

Calcular:

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

RECORDAR

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

IC
Todas las RT son (+)

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

IVC
$\left.\begin{array}{l} cos \\ sec \end{array}\right\}$ (+)
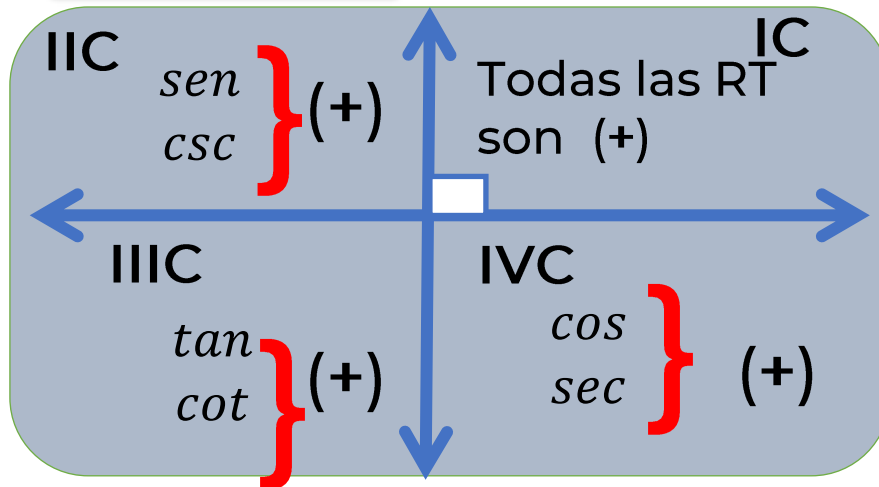
$$RT\left(\begin{array}{l} 180° \\ 360° \end{array} \pm \alpha\right) = \pm RT(\alpha)$$

Resolución:

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

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

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

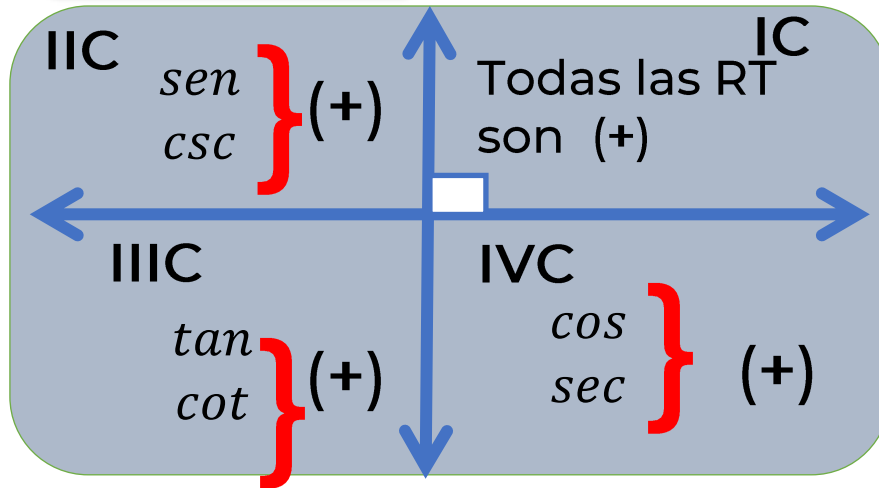$$L = \left(\dfrac{3}{5}\right)\left(\dfrac{4}{3}\right)$$

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

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PROBLEMA 9

Resolución:

Calcular:

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

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

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

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

RECORDAR

IIC

$\left.\begin{array}{c} sen \\ csc \end{array}\right\}$ **(+)**

IC

Todas las RT son **(+)**

IIIC

$\left.\begin{array}{c} tan \\ cot \end{array}\right\}$ **(+)**

IVC

$\left.\begin{array}{c} cos \\ sec \end{array}\right\}$ **(+)**

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

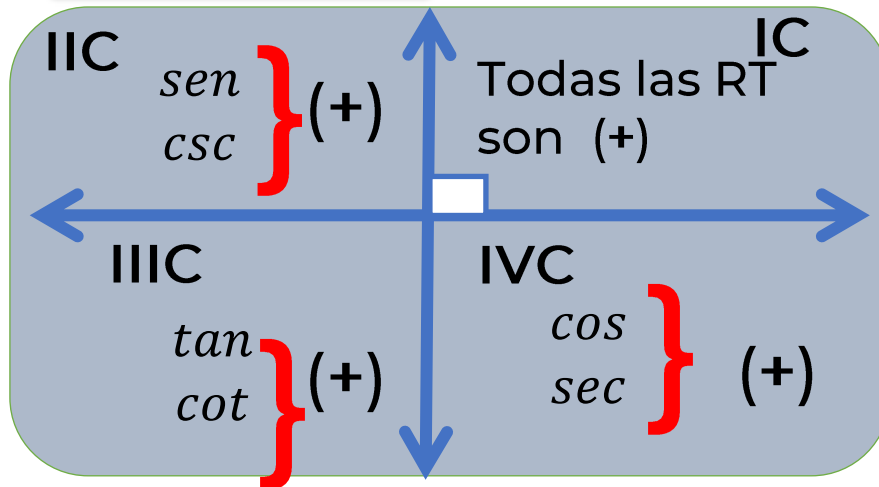Reemplazando:

$$M = cos20° + cos80° + (-cos80°) + (-cos20°)$$

M = 0

PROBLEMA 10

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

$$B = 5sen143° - \sqrt{3}.\cot300°$$

RECORDAR

IIC $\left.\begin{matrix} sen \\ csc \end{matrix}\right\}$ **(+)**   Todas las RT son **(+)**   **IC**

IIIC   **IVC**

$\left.\begin{matrix} tan \\ cot \end{matrix}\right\}$ **(+)** $\left.\begin{matrix} cos \\ sec \end{matrix}\right\}$ **(+)**

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

Resolución:

Resolvemos:

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

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

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

Reemplazamos:

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

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

∴ **Luis gasta 28 soles a la semana**