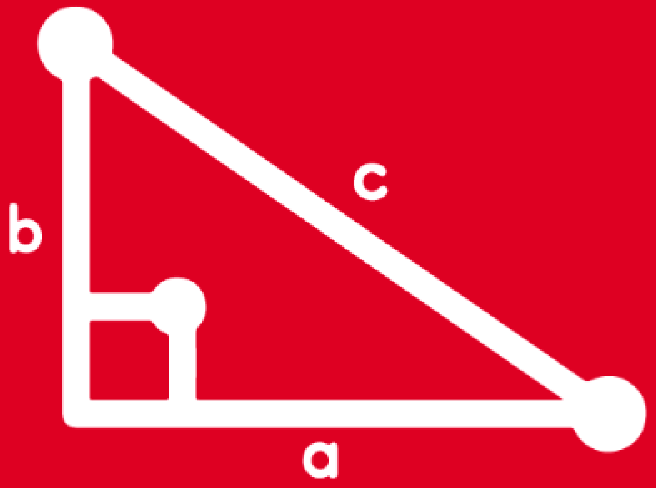
TRIGONOMETRY

Chapter 21

2nd
SECONDARY



REDUCCIÓN AL PRIMER CUADRANTE II

SACO OLIVEROS

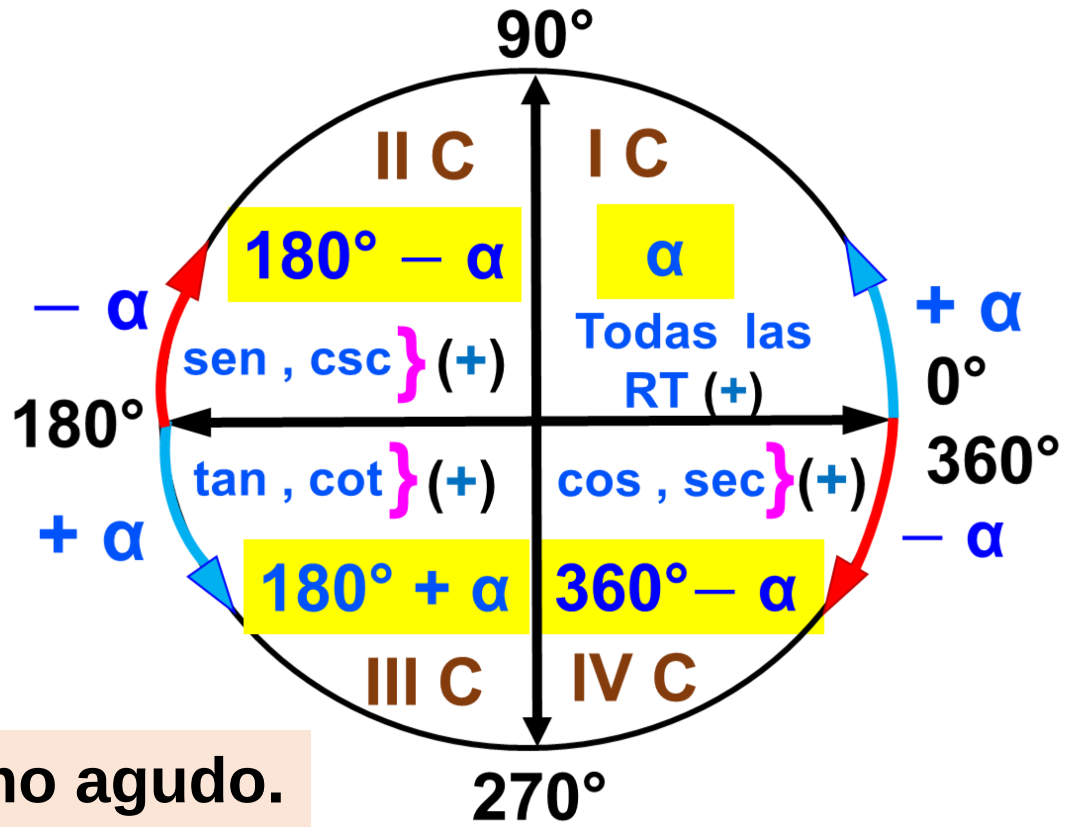
MOTIVATING STRATEGY

REDUCCIÓN AL PRIMER CUADRANTE II

En este capítulo, para ángulos de cualquier magnitud, determinaremos sus razones trigonométricas en términos de un ángulo α que pertenece al IC.

Esto ocurre si usamos ángulos cuadrantales del eje X :

$$\boxed{\begin{aligned} RT(180° \pm \alpha) &= \pm RT(\alpha) \\ RT(360° - \alpha) &= \pm RT(\alpha) \end{aligned}}$$

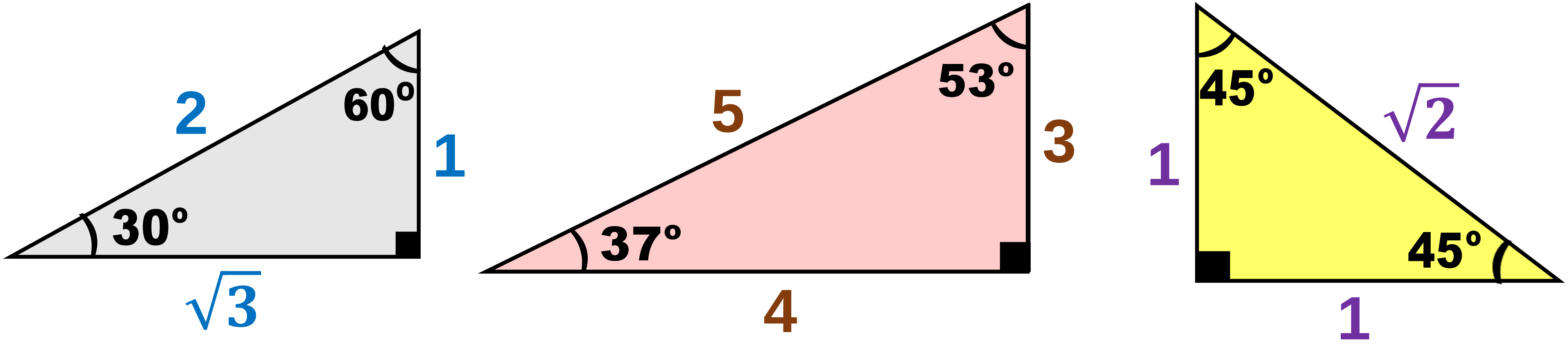


El signo (±) depende del cuadrante al que pertenece el ángulo a reducir y de la RT que lo afecta inicialmente.

Recuerda : El ángulo α es considerado como agudo.

REDUCCIÓN AL PRIMER CUADRANTE II

Además, en este capítulo debemos recordar los principales TRIÁNGULOS RECTÁNGULOS NOTABLES .



senα	cosα	tanα	cotα	secα	cscα
$\frac{CO}{H}$	$\frac{CA}{H}$	$\frac{CO}{CA}$	$\frac{CA}{CO}$	$\frac{H}{CA}$	$\frac{H}{CO}$

HELICO PRACTICE 1

Calcule $\tan 150^\circ$

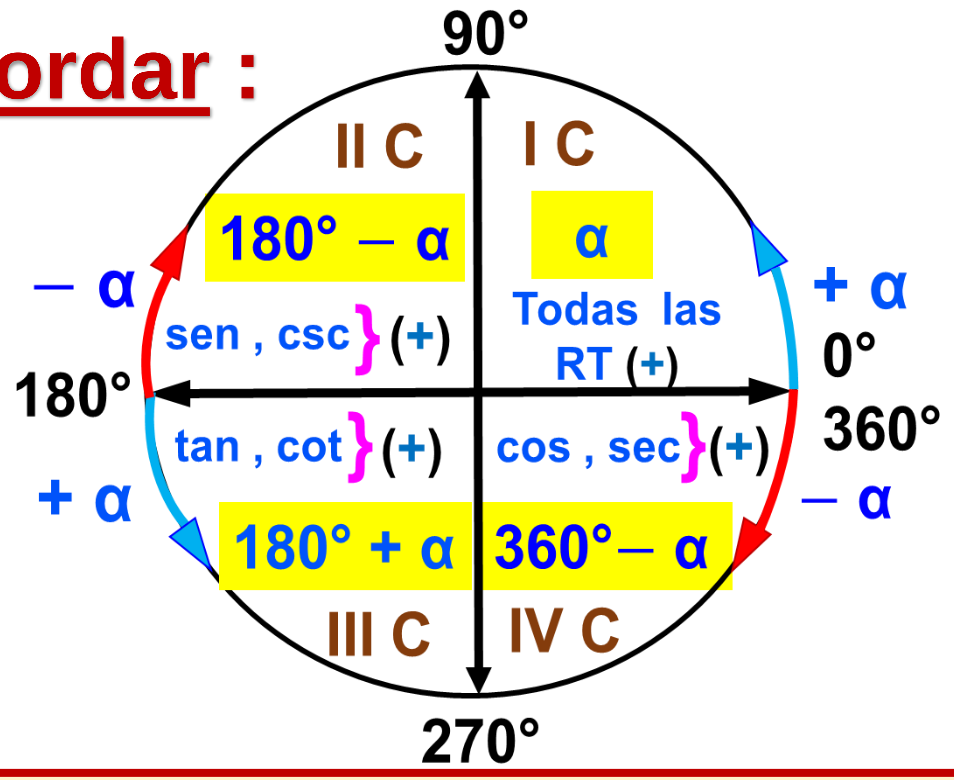
RESOLUCIÓN

$$\tan 150^\circ = \tan(\underbrace{180^\circ - 30^\circ}_{\text{II C}})$$

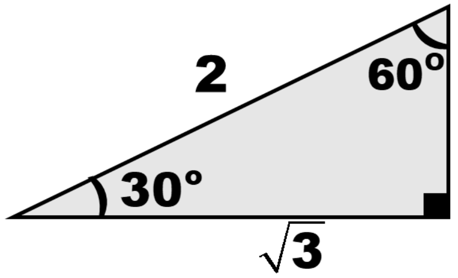
$$= -\tan 30^\circ = -\frac{1}{\sqrt{3}}$$

$$\boxed{\therefore\ \tan 150^\circ = -\frac{\sqrt{3}}{3}}$$

Recordar :



$$\boxed{RT(180^\circ \pm \alpha) = \pm RT(\alpha)}$$



HELICO PRACTICE 2

Calcule sec240º

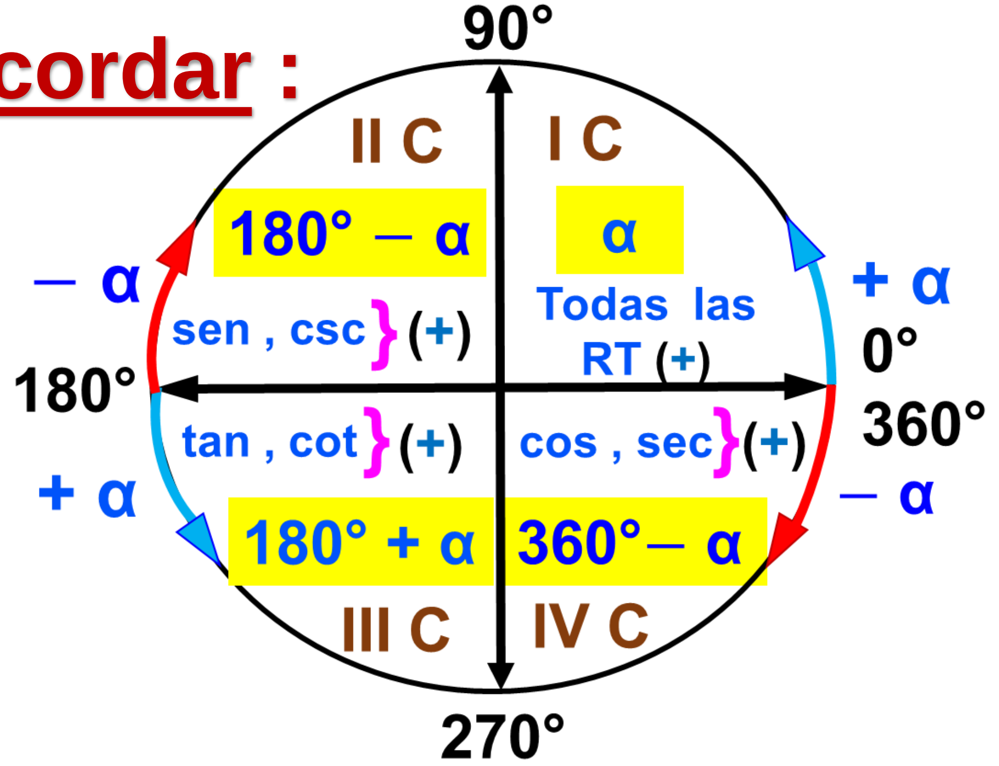
RESOLUCIÓN

$$\sec 240° = \sec(\underbrace{180° + 60°}_{\text{III C}})$$

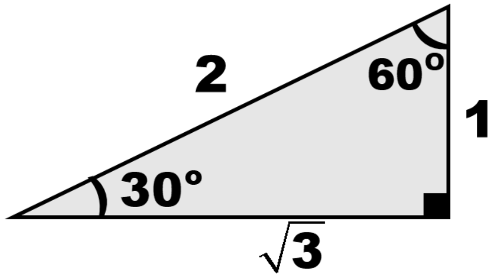
$$= -\sec 60°$$

$$\boxed{\therefore \sec 240° = -2}$$

Recordar :



$$\mathrm{RT}(180° \pm \alpha) = \pm\,\mathrm{RT}(\alpha)$$



HELICO PRACTICE 3

Recordar

Efectúe $Q = \sec 300^\circ \cdot \csc 233^\circ$

RESOLUCIÓN

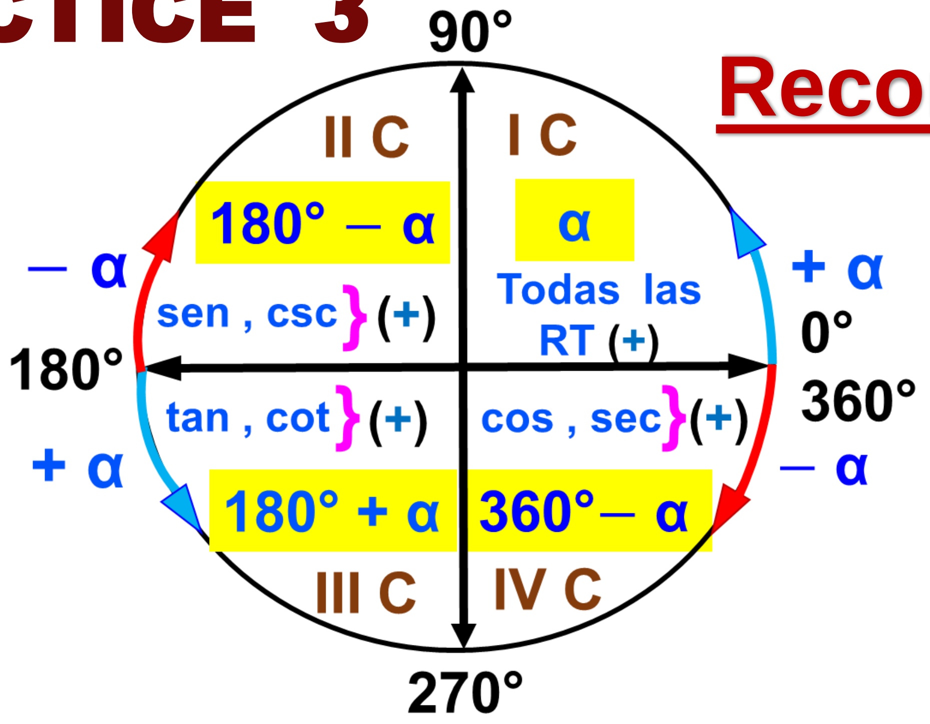
$$Q = \sec 300^\circ \cdot \csc 233^\circ$$

$$Q = \sec\underbrace{(360^\circ - 60^\circ)}_{\text{IV C}} \cdot \csc\underbrace{(180^\circ + 53^\circ)}_{\text{III C}}$$

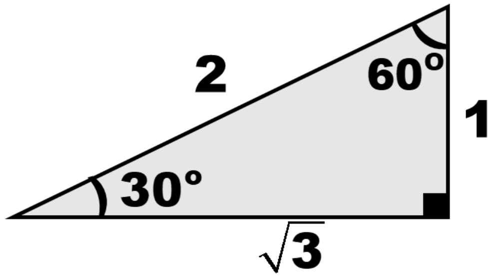
$$Q = (\sec 60^\circ)(-\csc 53^\circ)$$

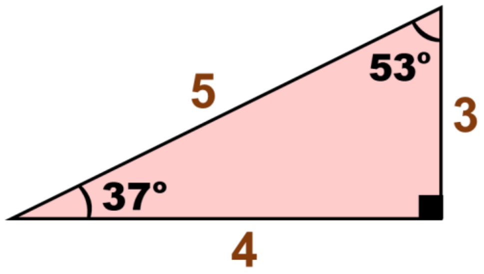
$$Q = (2)\left(-\frac{5}{4}\right)$$

$$\boxed{\therefore\ Q = -\frac{5}{2}}$$



$$\boxed{\begin{array}{l} RT(180^\circ \pm \alpha) = \pm RT(\alpha) \\ RT(360^\circ - \alpha) = \pm RT(\alpha) \end{array}}$$





HELICO PRACTICE 4

Efectúe $P = 5\ \text{sen}127° - \sqrt{2}\ \csc 225°$

RESOLUCIÓN

$$P = 5\ \text{sen}127° - \sqrt{2}\ \csc 225°$$

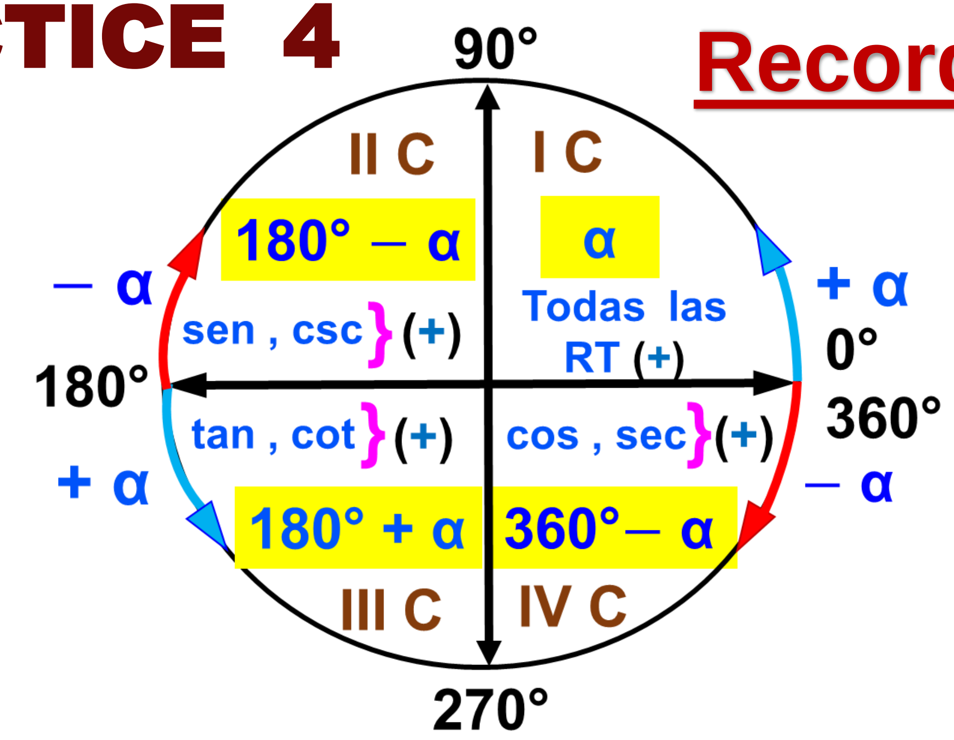
$$P = 5\ \text{sen}(\underbrace{180° - 53°}_{\text{II C}}) - \sqrt{2}\ \csc(\underbrace{180° + 45°}_{\text{III C}})$$

$$P = 5(\ \text{sen}53°\ ) - \sqrt{2}(\ -\csc 45°\ )$$

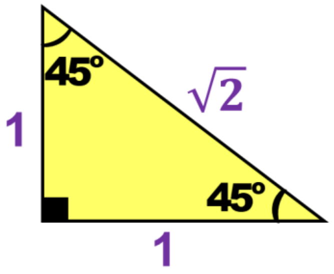
$$P = \cancel{5}\left(\frac{4}{\cancel{5}}\right) - \sqrt{2}(\ -\sqrt{2}\ ) = 4 + 2$$

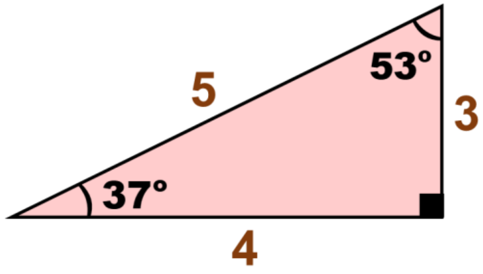
$$\boxed{\therefore P = 6}$$

Recordar



$$\boxed{RT(\ 180° \pm \alpha\ ) = \pm\ RT(\ \alpha\ )}$$





HELICO PRACTICE 5

Efectúe $T = \dfrac{\cot^2 330° + \sec^2 135°}{3\csc 217°}$

RESOLUCIÓN

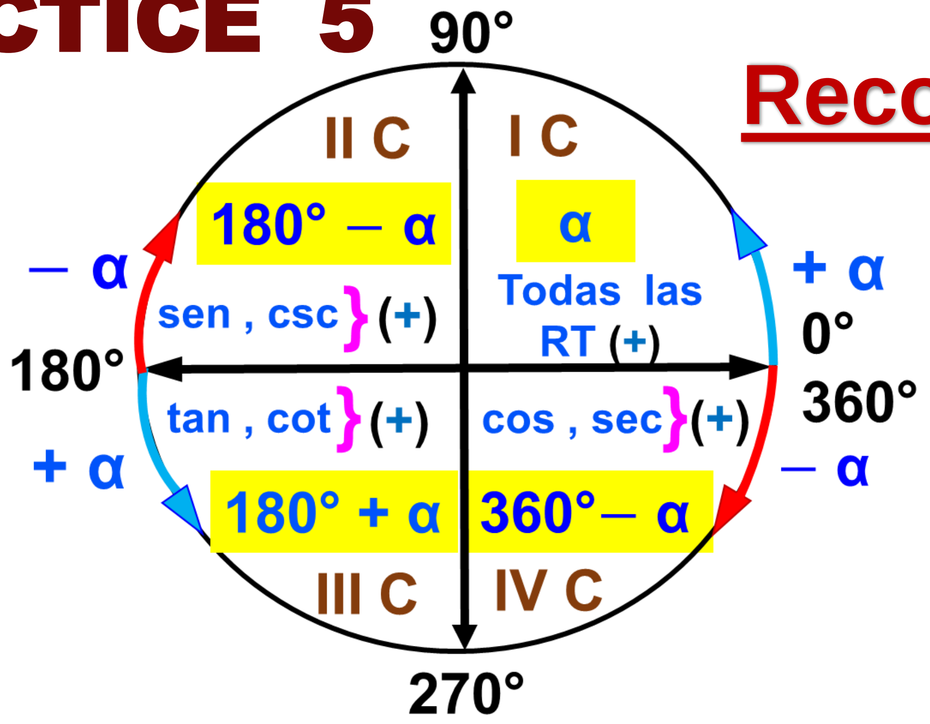
$$T = \frac{\cot^2\underbrace{(360° - 30°)}_{\text{IV C}} + \sec^2\underbrace{(180° - 45°)}_{\text{II C}}}{3\csc\underbrace{(180° + 37°)}_{\text{III C}}}$$

$$T = \frac{(-\cot 30°)^2 + (-\sec 45°)^2}{3(-\csc 37°)}$$

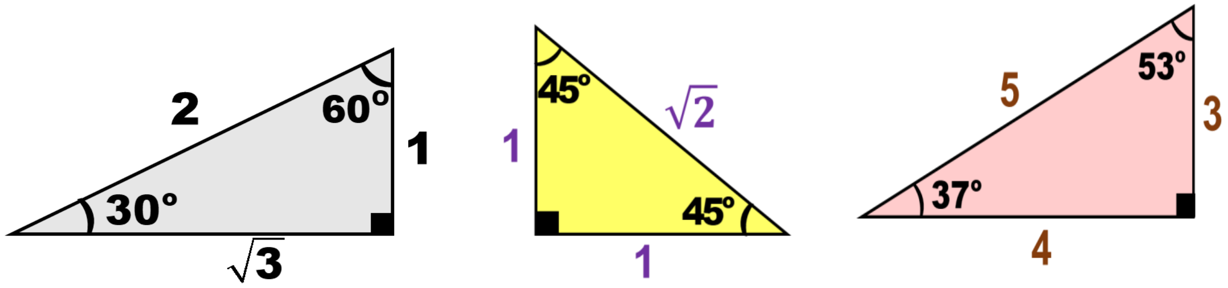
$$T = \frac{(-\sqrt{3})^2 + (-\sqrt{2})^2}{3\left(-\frac{5}{3}\right)} = \frac{3+2}{-5} = \frac{5}{-5}$$

$$\boxed{\therefore\ T = -1}$$

Recordar

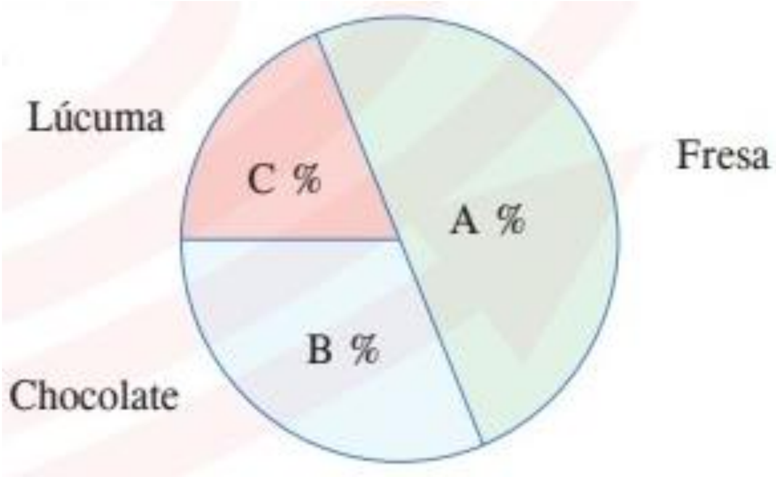


$$\boxed{\begin{aligned} RT(180° \pm \alpha) &= \pm RT(\alpha) \\ RT(360° - \alpha) &= \pm RT(\alpha) \end{aligned}}$$



HELICO PRACTICE 6

El siguiente gráfico muestra los resultados porcentuales de una encuesta sobre las preferencias con respecto a tres sabores de helados.- Calcule la suma del mínimo y máximo porcentaje de preferencia de los sabores encuestados..



Donde :

A = 50 cot225°

B = 60 sen150°

C = 10 sec²135°

RESOLUCIÓN

$A = 50\cot(\underbrace{180° + 45°}_{\text{III C}}) = 50\cot 45° = 50(1) = 50$ máximo

$B = 60\,\text{sen}(\underbrace{180° - 30}_{\text{III C}}) = 60\,\text{sen}30° = 60\left(\frac{1}{2}\right) = 30$

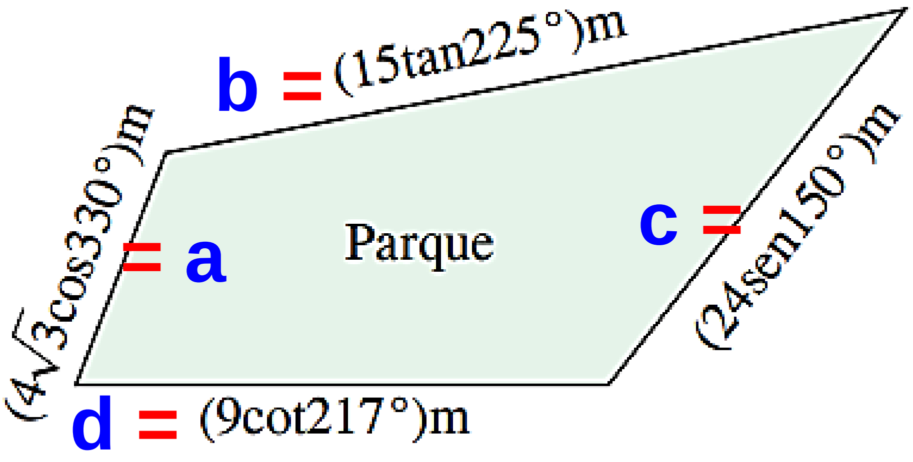
$C = 10\sec^2(\underbrace{180° - 45°}_{\text{II C}}) = 10(-\sec 45°)^2 = 10(-\sqrt{2})^2$

$C = 10(2) = 20$ = mínimo

$\therefore \text{Suma} = C\% + A\% = 20\% + 50\% = 70\%$

HELICO PRACTICE 7

Diana, como parte de su diaria rutina de ejercicios, realiza una caminata alrededor de un parque cerca de su casa .- Su rutina consiste en realizar tres vueltas completas alrededor del perímetro del parque.- Si las dimensiones del parque son las mostradas en el gráfico …
¿Cuántos metros recorre Diana en una mañana ?



RESOLUCIÓN

$$a = (4\sqrt{3}\cos(\overbrace{360° - 30°}^{\text{IV C}}))\text{ m} = (4\sqrt{3}\cos 30°)\text{m} = (4\sqrt{3} \cdot \frac{\sqrt{3}}{2})\text{m} = 6\text{ m}$$

$$b = (15\tan(\overbrace{180° + 45°}^{\text{III C}}))\text{ m} = (15\tan 45°)\text{m} = (15 \cdot 1)\text{m} = 15\text{ m}$$

$$c = (24\,\text{sen}(\overbrace{180° - 30°}^{\text{II C}}))\text{ m} = (24\,\text{sen}30°)\text{m} = (24 \cdot \frac{1}{2})\text{m} = 12\text{ m}$$

$$d = (9\cot(\overbrace{180° + 37°}^{\text{III C}}))\text{ m} = (9\cot 37°)\text{m} = (9 \cdot \frac{4}{3})\text{m} = 12\text{ m}$$

$\therefore$ **Recorrido = 3 (6 m + 15 m + 12 m + 12 m) = 135 m**

SACO OLIVEROS