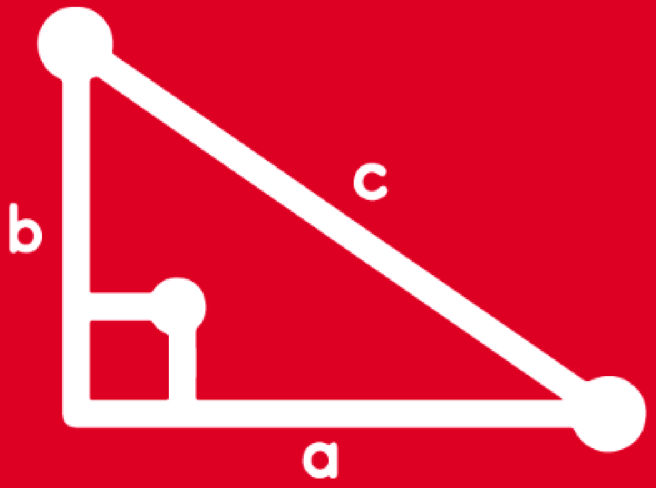
TRIGONOMETRY

TOMO VI

2nd
SECONDARY



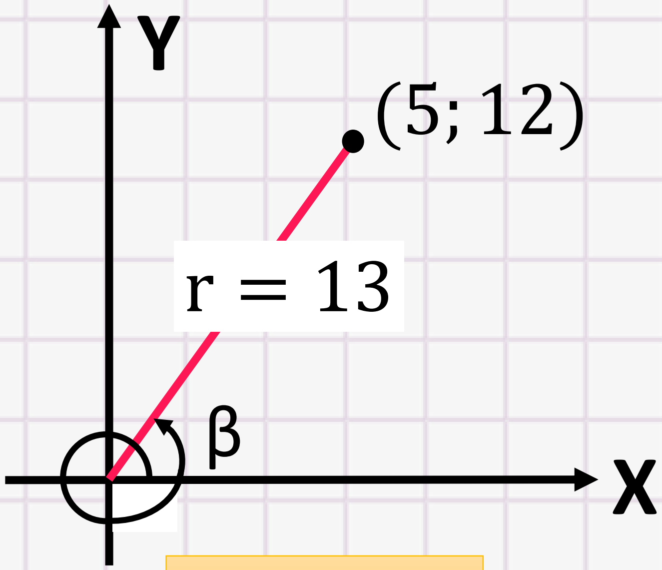
FEEDBACK

SACO OLIVEROS


Tus metas
SON MÁS
grandes
QUE TUS
MIEDOS

1 Del gráfico, efectúe

$N = \csc\beta - \cot\beta$



Recordar:

$\csc\beta = \dfrac{r}{y}$ $\cot\beta = \dfrac{x}{y}$

RESOLUCIÓN

- Calculando el radio vector

$$\boxed{r = \sqrt{(x)^2 + (y)^2}}$$

$$r = \sqrt{\underbrace{5^2}_{25} + \underbrace{12^2}_{144}} \Rightarrow r = \sqrt{169} \Rightarrow r = 13$$

x = 5	y = 12	r = 13

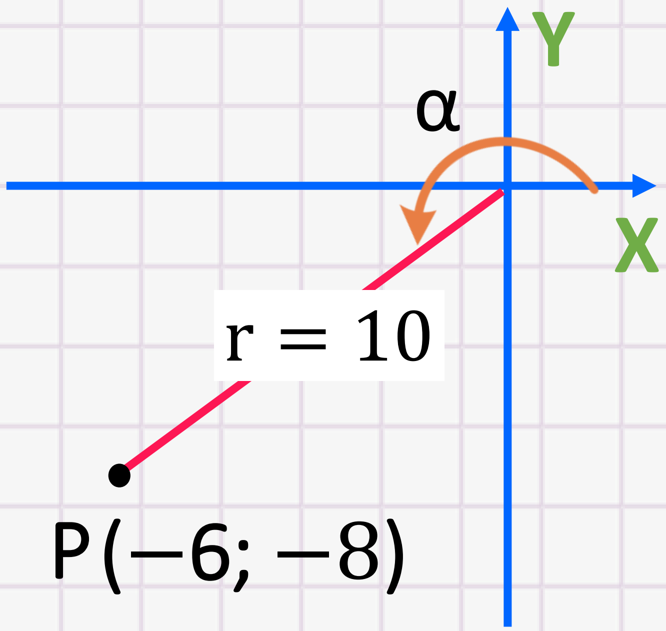
Calculamos: $N = \csc\beta - \cot\beta$

$$\Rightarrow N = \frac{13}{12} - \frac{5}{12} \Rightarrow N = \frac{\cancel{8}^{\,2}}{\cancel{12}_{\,3}} \quad \therefore \boxed{N = \frac{2}{3}}$$

2

Si el punto P(−6; −8) pertenece al lado final del ángulo α en posición normal.
Calcule $E = 16\cot\alpha - 18\sec\alpha$.

RESOLUCIÓN



- Calculando el radio vector

$$\boxed{r = \sqrt{(x)^2 + (y)^2}}$$

$$r = \sqrt{(-6)^2 + (-8)^2}$$

$$r = \sqrt{36 + 64}$$

$$r = \sqrt{100}$$

$$r = 10$$

x = − 6	y = − 8	r = 10

Calculamos:

$E = 16\cot\alpha - 18\sec\alpha$

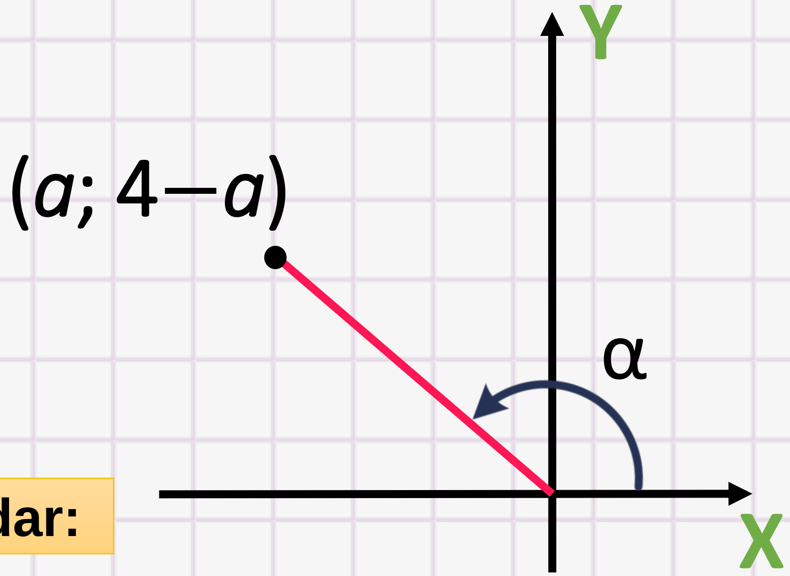
$$E = \overset{2}{\cancel{16}}\left(\frac{-6}{\underset{1}{\cancel{-8}}}\right) - \overset{3}{\cancel{18}}\left(\frac{10}{\underset{1}{\cancel{-6}}}\right)$$

$E = 12 + 30$ ∴ $\boxed{E = 42}$

3

Del gráfico, calcule el valor de *a* si

$\cot\alpha = -\frac{3}{4}$



Recordar:

$$\cot\alpha = \frac{x}{y}$$

RESOLUCIÓN

- Del gráfico:

$$\cot\alpha = \frac{a}{4-a} \quad \ldots\ldots\ldots\ldots(\mathrm{I})$$

- Del dato:

$$\cot\alpha = -\frac{3}{4} \quad \ldots\ldots\ldots\ldots(\mathrm{II})$$

De (I) y (II):

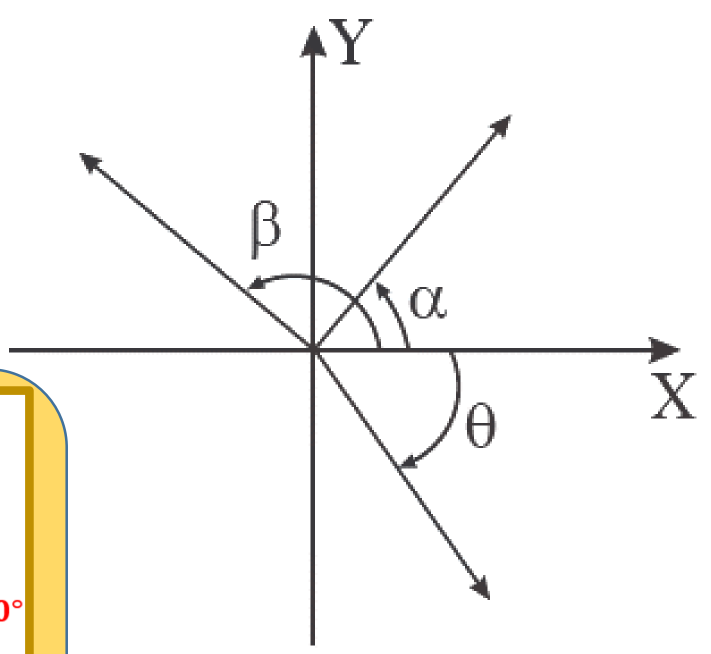
$$\frac{a}{4-a} = -\frac{3}{4} \Rightarrow 4a = -12 + 3a$$

$$\therefore \boxed{a = -12}$$

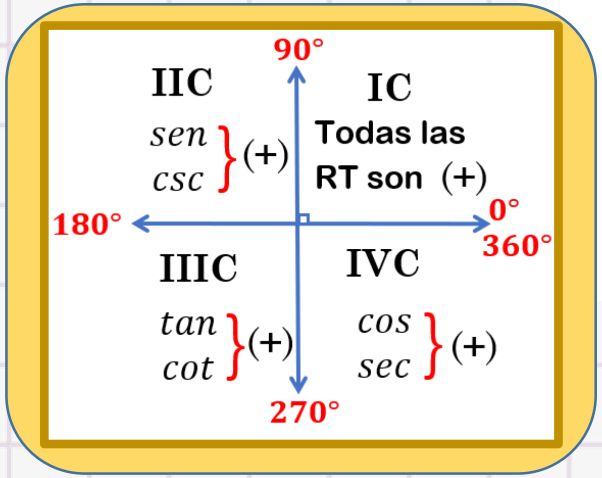
4

Del gráfico, determine el signo de:

$$E = \frac{\csc\theta . \sec\alpha}{\tan\beta}$$



Recordar:



RESOLUCIÓN

- Del gráfico:

$\alpha \in IC$	$\beta \in IIC$	$\theta \in IVC$

- Hallamos el signo de:

$$E = \frac{\csc\theta . \sec\alpha}{\tan\beta}$$

$$E = \frac{(-)(+)}{(-)} \Rightarrow E = \frac{(-)}{(-)}$$

$$\therefore \boxed{E = (+)}$$

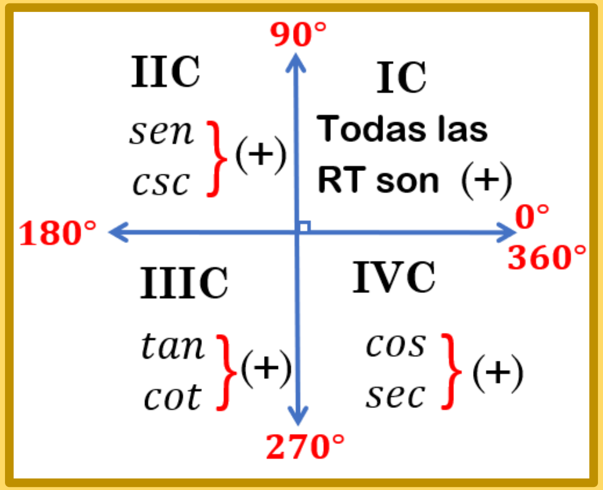
5

Si $\alpha \in$ IIC y $\theta \in$ IIIC, determine el signo de:

$$A = \frac{\operatorname{sen}\alpha}{\tan\theta}$$

$$B = \tan^2\alpha \cdot \csc^3\theta$$

Recordar:



RESOLUCIÓN

- Hallamos el signo de:

$$A = \frac{\operatorname{sen}\alpha}{\tan\theta}$$

$$A = \frac{(+)}{(+)}$$

$$A = (+)$$

$$B = \tan^2\alpha \cdot \csc^3\theta$$

$$B = (-)^2(-)^3$$

$$B = (+)(-)$$

$$B = (-)$$

$\therefore$ $(+)\,;(-)$

6

Determine el signo en cada caso:

$M = \tan 84° . \text{sen}179°$

$$N = \frac{\sec 220° . \csc 70°}{\text{sen}280°}$$

Recordar:

IIC: sen, csc } (+)

IC: Todas las RT son (+)

IIIC: tan, cot } (+)

IVC: cos, sec } (+)

90°, 180°, 0°, 360°, 270°

RESOLUCIÓN

- Hallamos el signo de:

$$M = \tan \underbrace{84°}_{IC} . \text{sen} \underbrace{179°}_{IIC} = (+)(+)$$

$\Rightarrow$ $M = (+)$

$$N = \frac{\sec \overbrace{220°}^{IIIC} . \csc \overbrace{70°}^{IC}}{\text{sen} \underbrace{280°}_{IVC}} = \frac{(\cancel{-})(+)}{(\cancel{-})}$$

$\Rightarrow$ $N = (+)$

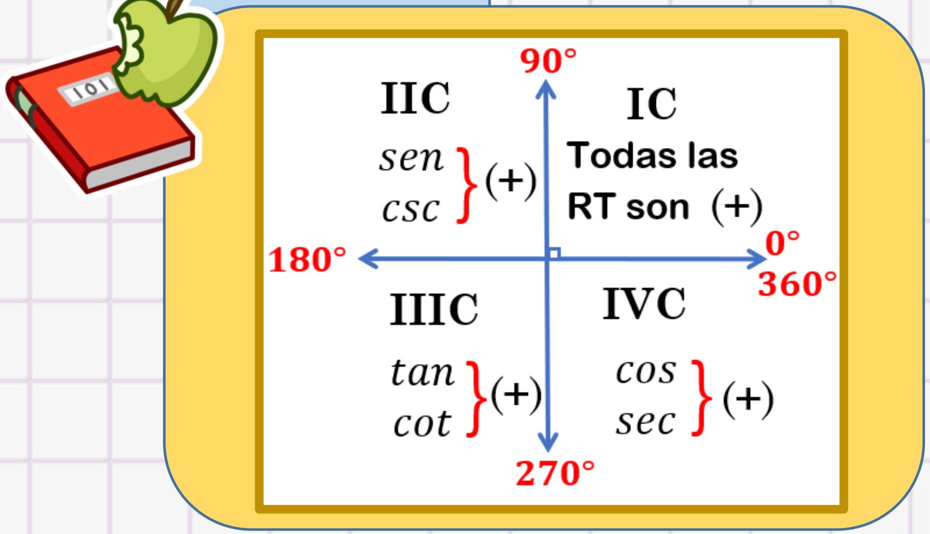
$\therefore$ $\boxed{(+); (+)}$

7

Si $270° < \theta < 360°$,
determine el signo de:

$$P = \cos\left(\frac{\theta}{2}\right) . \tan\left(\frac{\theta}{3}\right)$$

Recordar:



RESOLUCIÓN

I) $270° < \theta < 360° \Rightarrow 135° < \underbrace{\left(\frac{\theta}{2}\right)}_{\text{IIC}} < 180°$

$\Rightarrow \cos\left(\frac{\theta}{2}\right) = (-)$

II) $270° < \theta < 360° \Rightarrow 90° < \underbrace{\left(\frac{\theta}{3}\right)}_{\text{IIC}} < 120°$

$\Rightarrow \tan\left(\frac{\theta}{3}\right) = (-)$

Hallamos signo de: $P = \cos\left(\frac{\theta}{2}\right) . \tan\left(\frac{\theta}{3}\right)$

$\Rightarrow P = (-)(-)$

$\therefore$ $\boxed{P = (+)}$

8

Efectúe:

$$W = (\csc 270° + \sec 180°)^2(\text{sen}90° + \cos 360°)^3$$

RESOLUCIÓN

Usando las RT de ángulos cuadrantales:

$$W = ((-1) + (-1))^2\,((1) + (1))^3$$

$$W = (-2)^2(2)^3$$

$$W = (4)(8)$$

$$\therefore\ W = 32$$

Recordar:

RT \ ∢	0°	90°	180°	270°	360°
sen	0	1	0	–1	0
cos	1	0	–1	0	1
tan	0	ND	0	ND	0
cot	ND	0	ND	0	ND
sec	1	ND	– 1	ND	1
csc	ND	1	ND	–1	ND

9

Calcule el valor de x, si:

$2x\cos 360° + 3\csc 90° = \text{sen}270° - x\tan 180°$

RESOLUCIÓN

Usando las RT de ángulos cuadrantales:

$2x\,(1) + 3\,(1) = (-1) - \cancel{x\,(0)}$

$2x + 3 = -1$

$2x = -4$

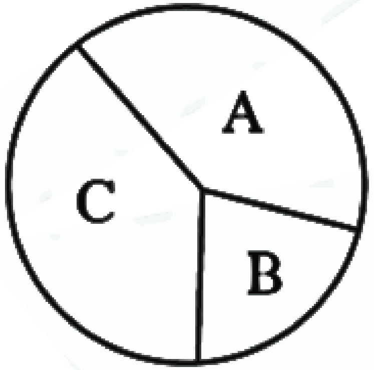
$\therefore\ \boxed{x = -2}$

Recordar:

RT \ ∡	0°	90°	180°	270°	360°
sen	0	1	0	$\boxed{-1}$	0
cos	1	0	–1	0	$\boxed{1}$
tan	0	ND	$\boxed{0}$	ND	0
cot	ND	0	ND	0	ND
sec	1	ND	–1	ND	1
csc	ND	$\boxed{1}$	ND	–1	ND

10

A continuación se muestra la distribución de la memoria de un dispositivo USB con capacidad de 16GB.



A: archivos
B: música
C: espacio disponible

Donde:

$A = (4\operatorname{sen}90° - 2\operatorname{sen}270°)\ GB$

$B = (5\cos360° + 2\sec180°)\ GB$

Determine el espacio disponible del USB.

RESOLUCIÓN

Usando las RT de ángulos cuadrantales:

- $A = (4(1) - 2(-1))\ GB$

$A = (4 + 2)\ GB \rightarrow \boxed{A = 6\ GB}$

- $B = (5(1) + 2(-1))\ GB$

$B = (5 - 2)\ GB \rightarrow \boxed{B = 3\ GB}$

Calculamos el espacio disponible C:

$\therefore\ \boxed{C = 7\ GB}$

SACO OLIVEROS