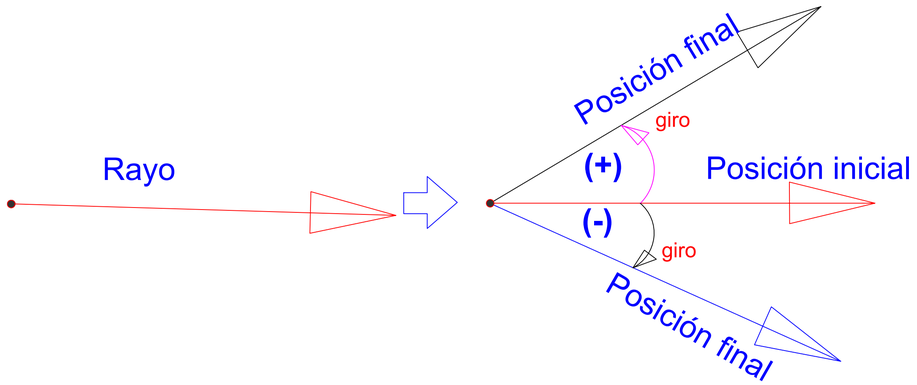
ÁNGULO TRIGONOMÉTRICO

Es una figura generada por la rotación de un rayo (la rotación se realiza en un mismo plano), alrededor de un punto fijo llamado vértice, desde una posición inicial hasta una posición final.



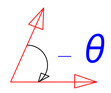
Características del ángulo trigonométrico

Son

Sentido

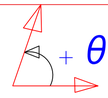
Pueden ser

Horario

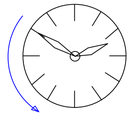


Genera ángulos (-)

Antihorario



Genera ángulos (+)



Magnitud

Pueden ser

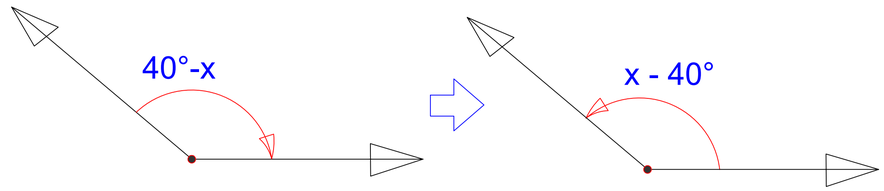
1 vuelta

2 vueltas

$-\infty < m\angle \text{trigonométrico} < +\infty$

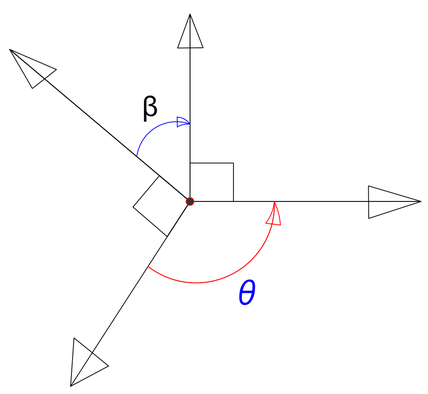
Observación

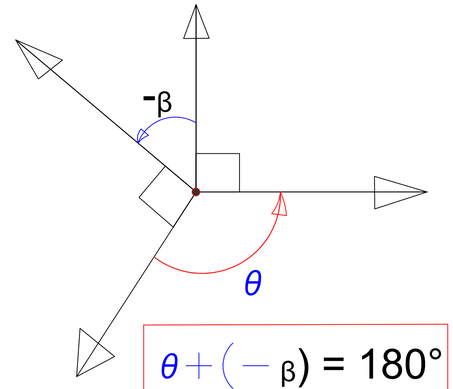
Si a un ángulo trigonométrico cambiamos el sentido de rotación, entonces el valor de su medida cambia de signo.
Veamos: Sea un ángulo que mide: 40º - X. Si cambiamos el sentido entonces mide: X - 40º



Observación

Para sumar ángulos trigonométricos formados alrededor de un mismo vértice, estos ángulos deben tener el mismo sentido de rotación.

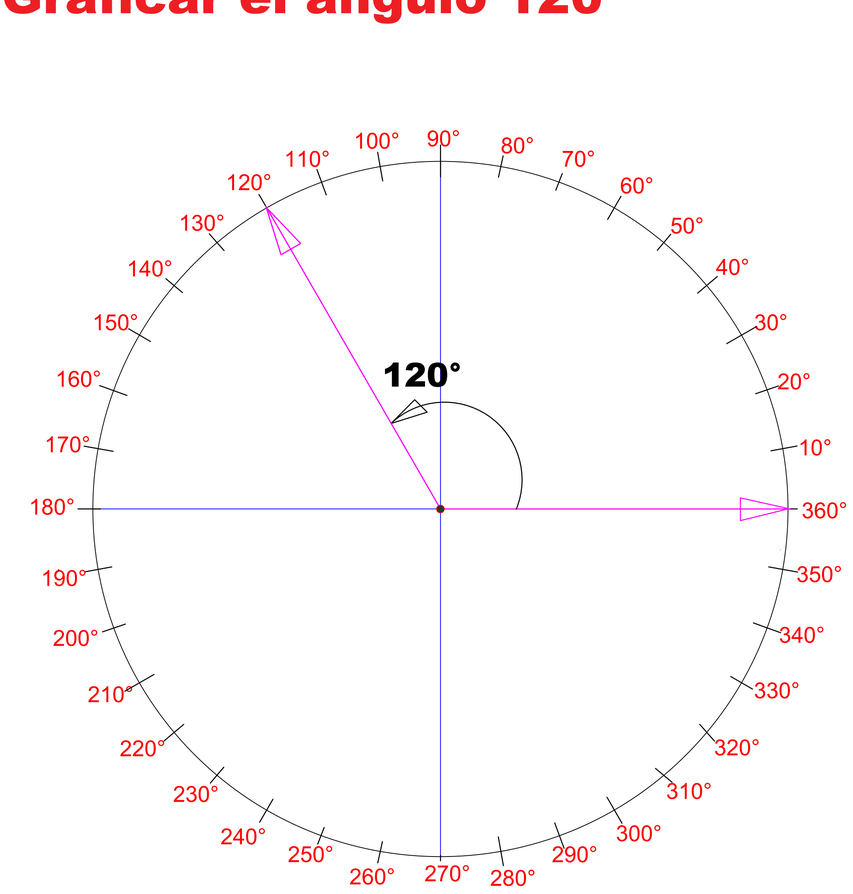


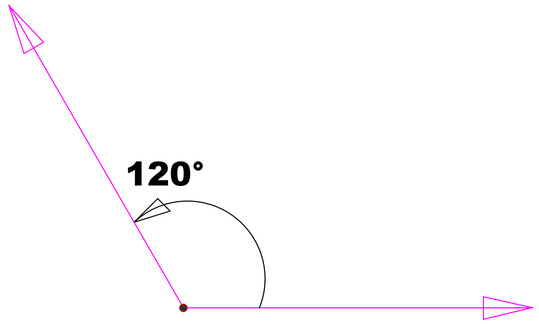


$\theta + (-\beta) = 180°$

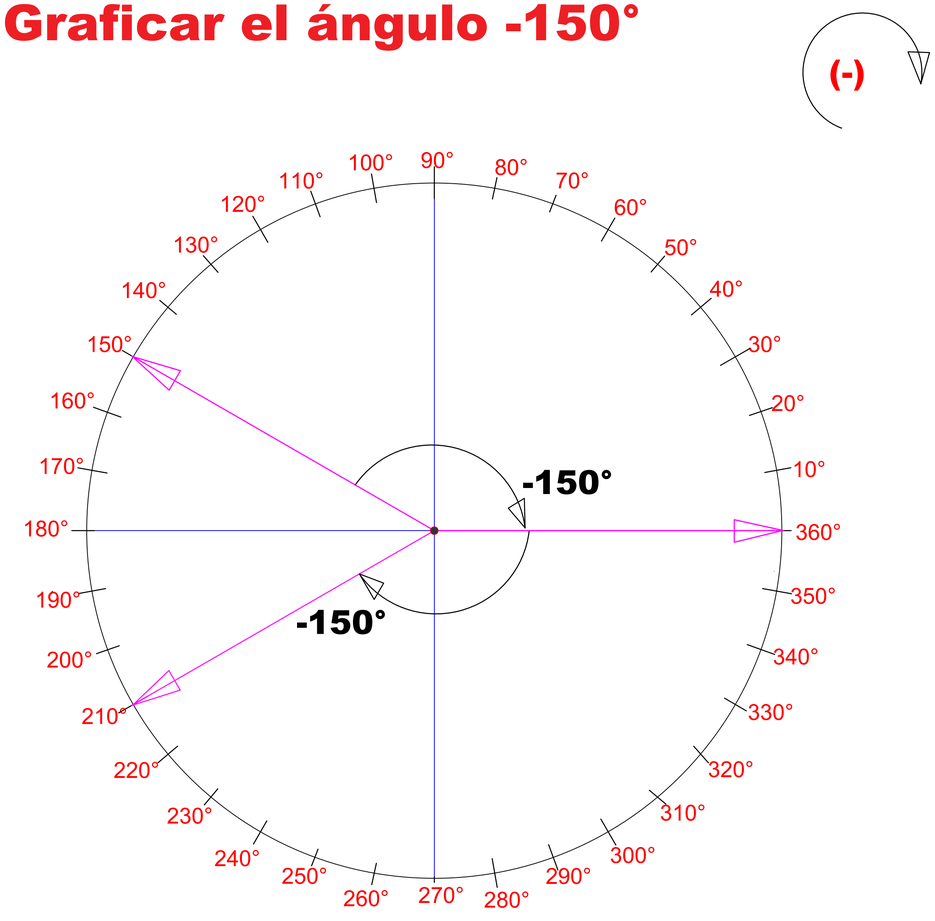
$\theta - \beta = 180°$

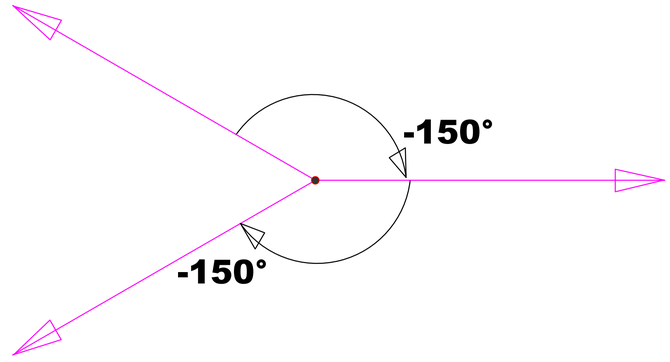
Graficar el ángulo 120°



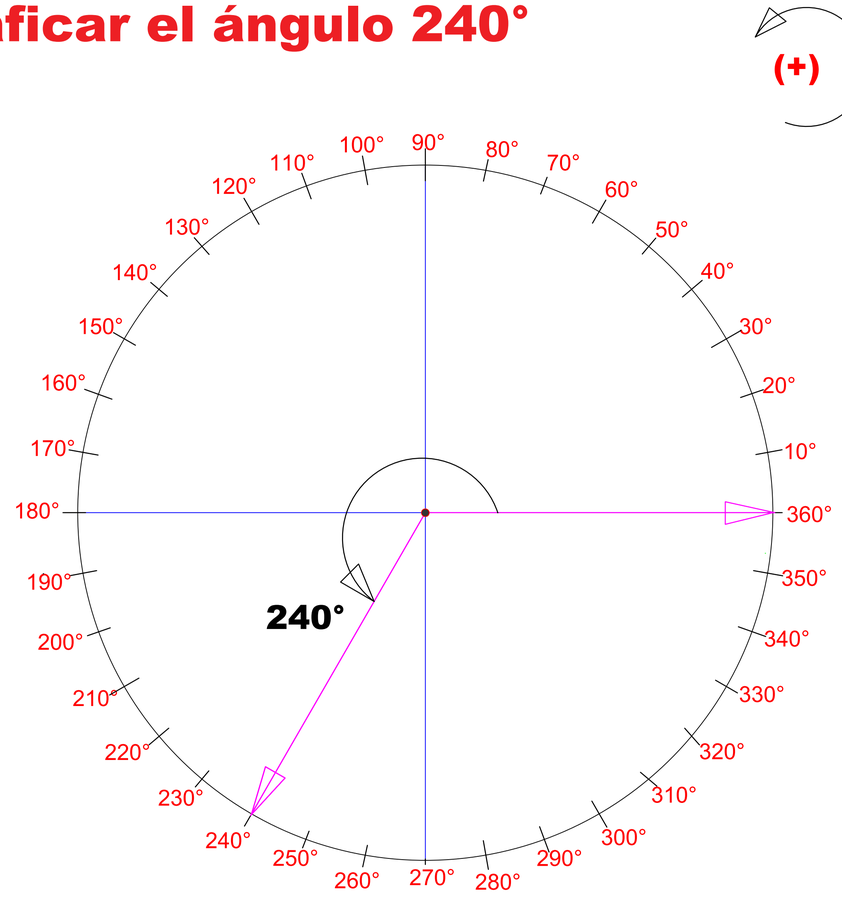


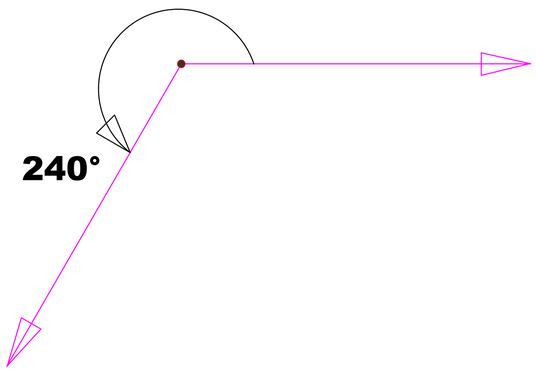
Graficar el ángulo -150°



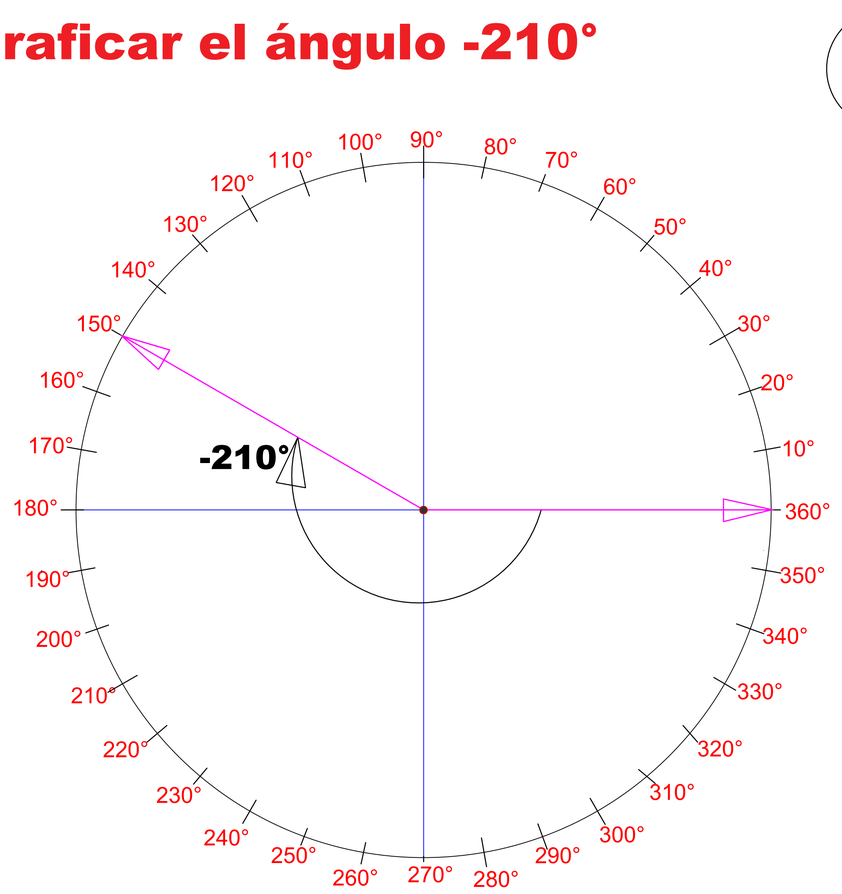


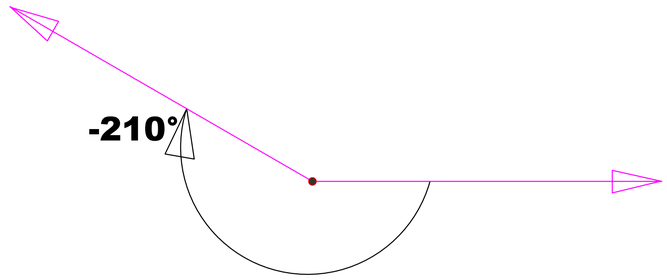
Graficar el ángulo 240°





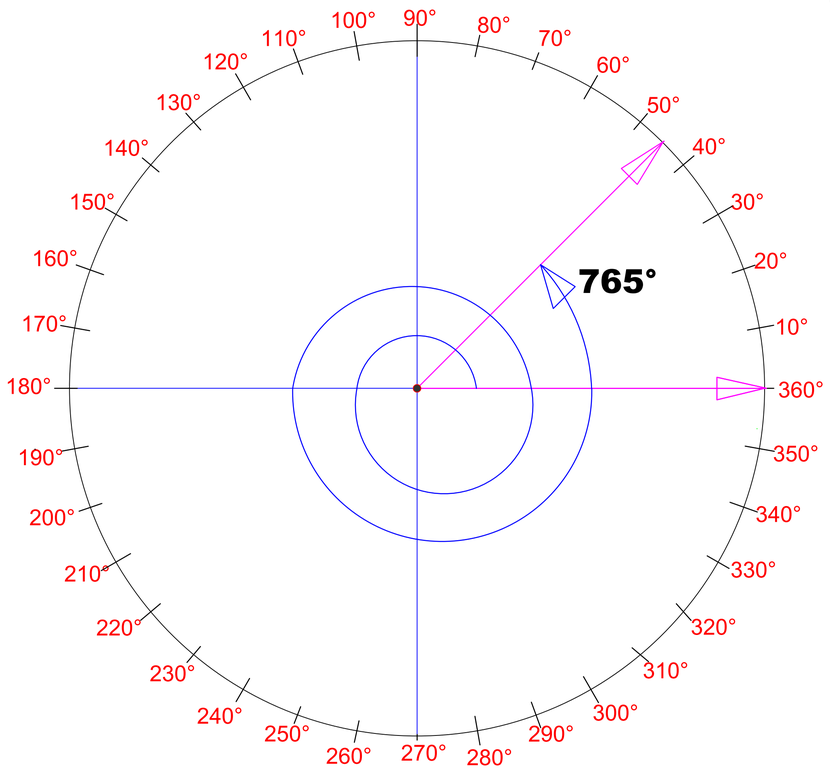
Graficar el ángulo -210°

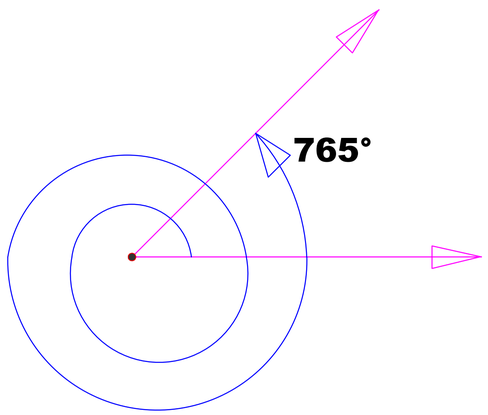




Graficar el ángulo 765°

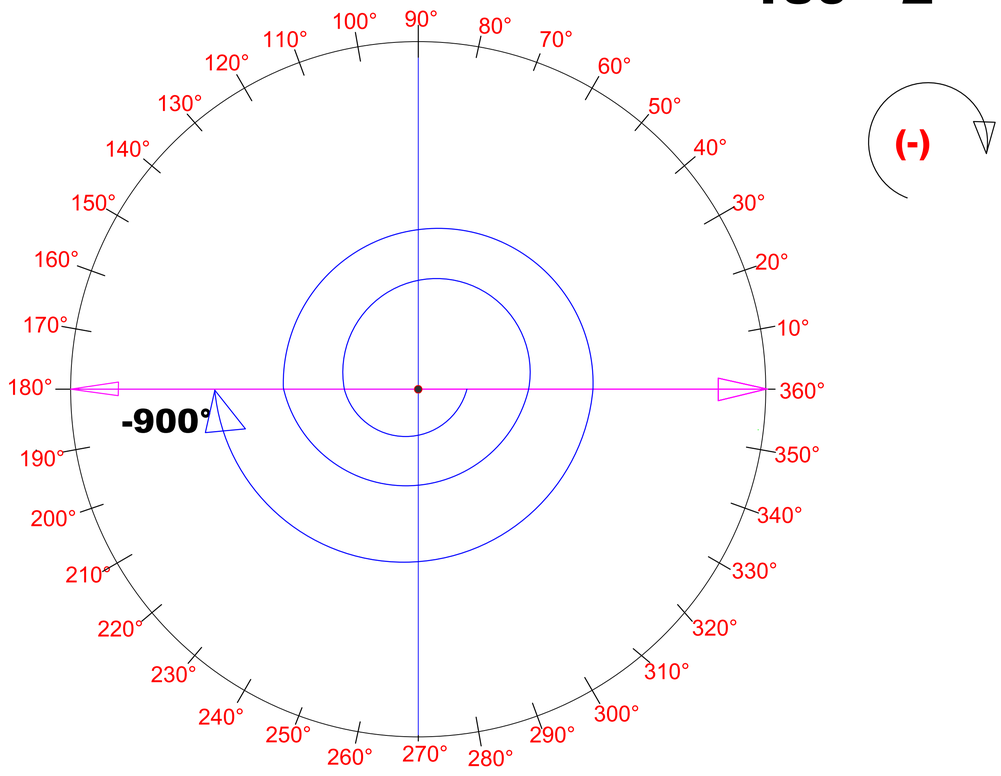
$$\begin{array}{r|l} 765° & 360 \\ 45° & 2 \end{array}$$

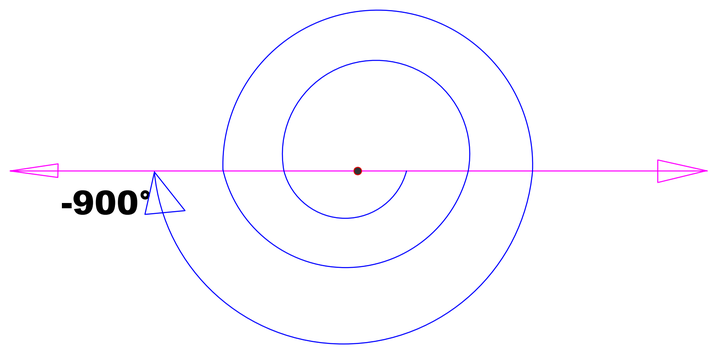




Graficar el ángulo -900°

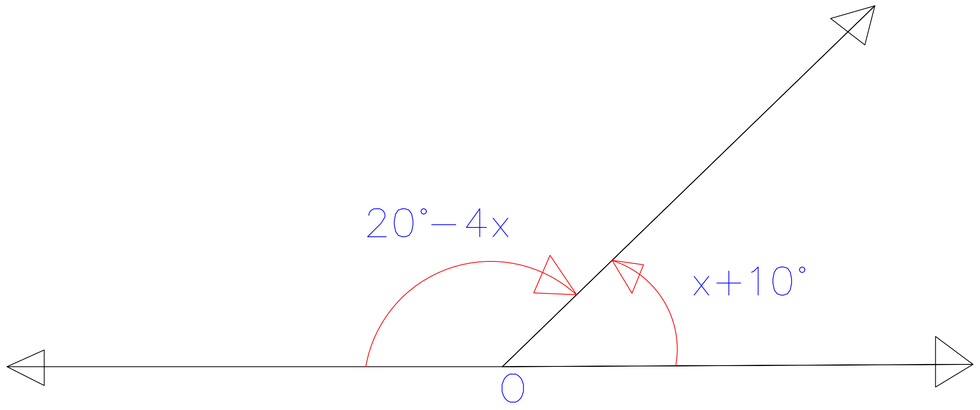
$$\begin{array}{r|l} -900° & 360 \\ -180° & 2 \end{array}$$



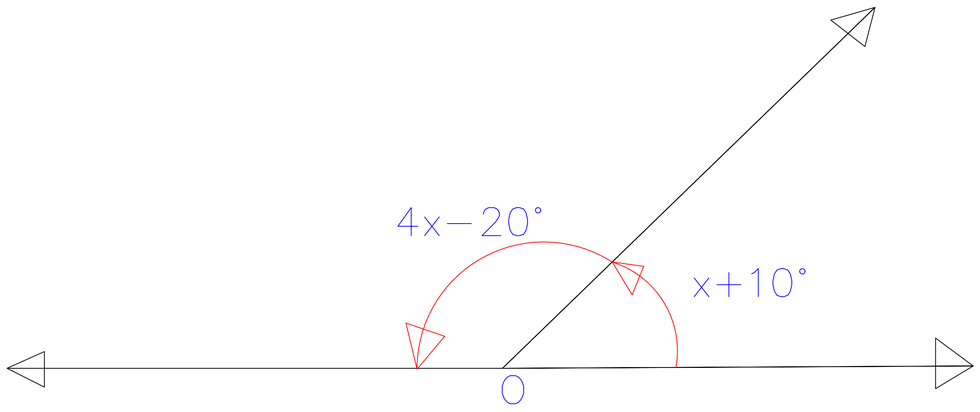


Pregunta 1

Determinar el valor de "x"



Resolución



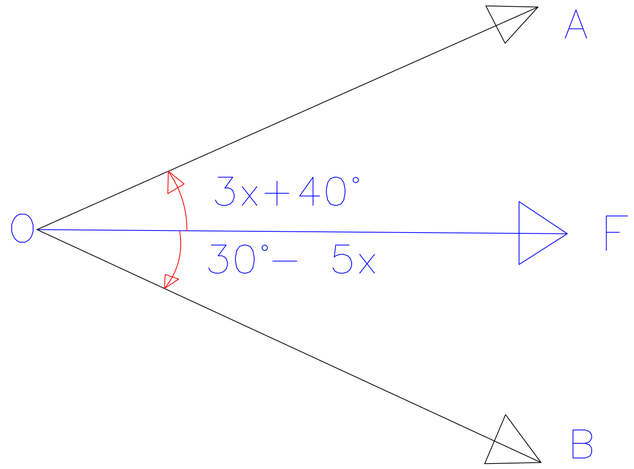
$(4x-20^\circ) + (x+10^\circ) = 180^\circ$

$\rightarrow 5x = 180^\circ + 10^\circ = 190^\circ$

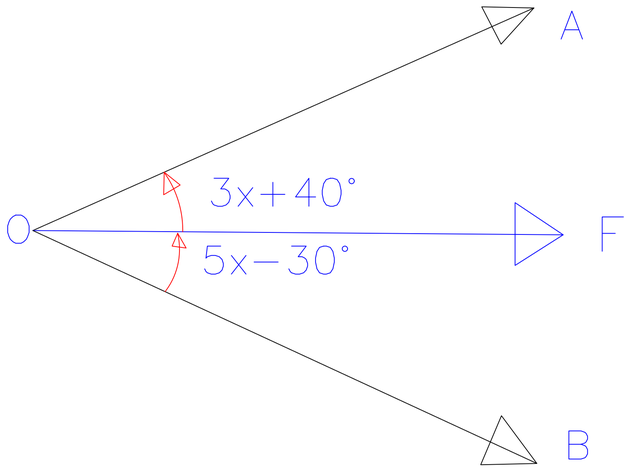
$\rightarrow x = \frac{190^\circ}{5} = 38^\circ$

Pregunta 2

Determinar el valor de "x", además $\overrightarrow{OF}$ es bisectriz



Resolución



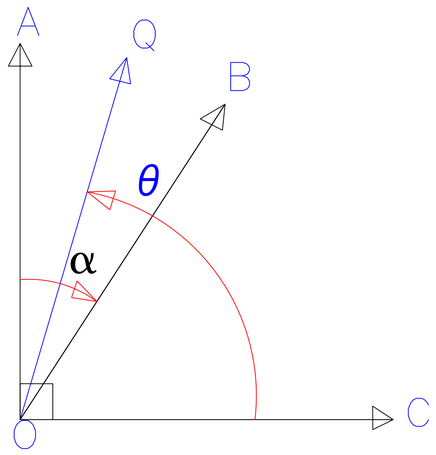
$3x + 40^\circ = 5x - 30^\circ$

$\rightarrow 5x - 3x = 40^\circ + 30^\circ$

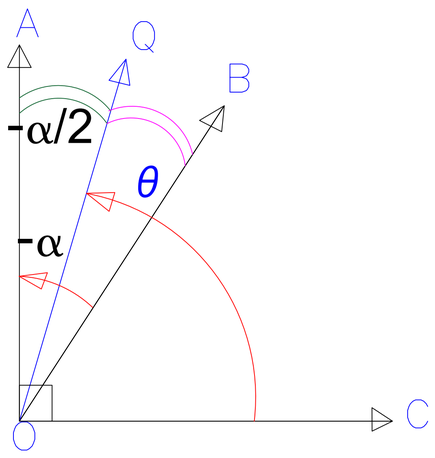
$\rightarrow 2x = 70^\circ \rightarrow x = 35^\circ$

Pregunta 3

Determinar una relación entre los ángulos, si $\overrightarrow{OQ}$ es bisectriz del ángulo AOB



Resolución

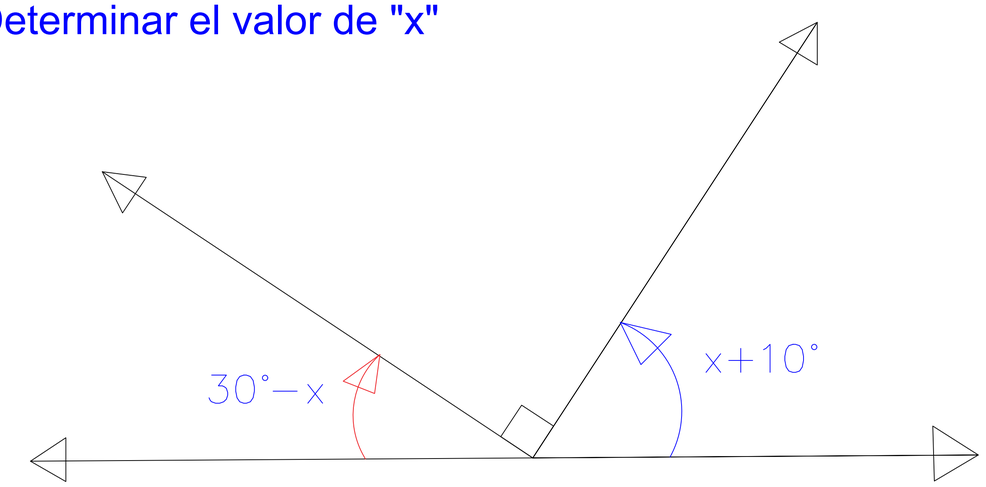


$\theta + (-\alpha/2) = 90^\circ$

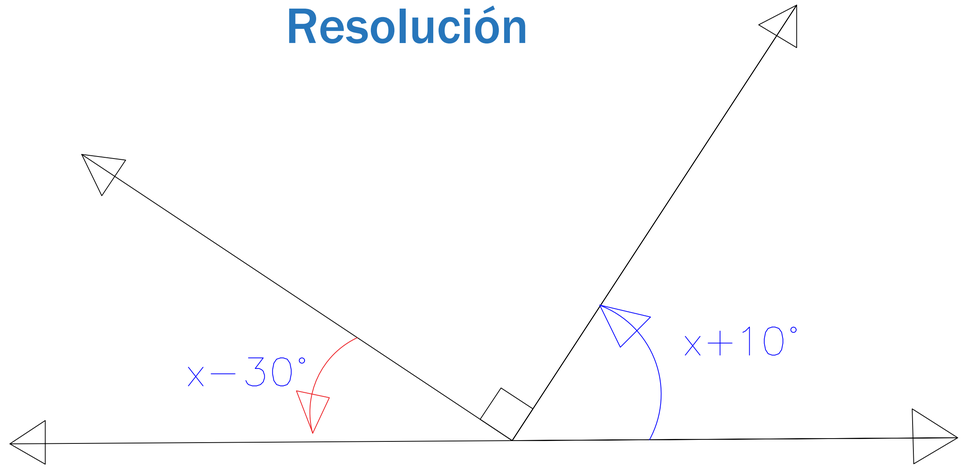
$2\theta - \alpha = 180^\circ$

Pregunta 4

Determinar el valor de "x"



Resolución



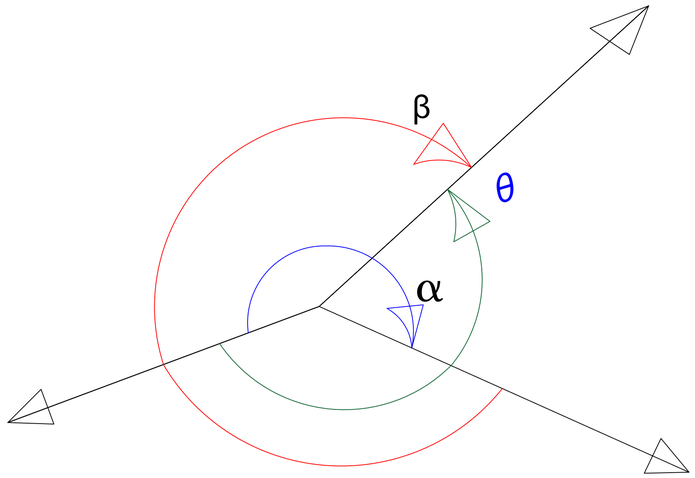
$(x+10^\circ) + (x-30^\circ) = 90^\circ$

$\rightarrow 2x - 20^\circ = 90^\circ$

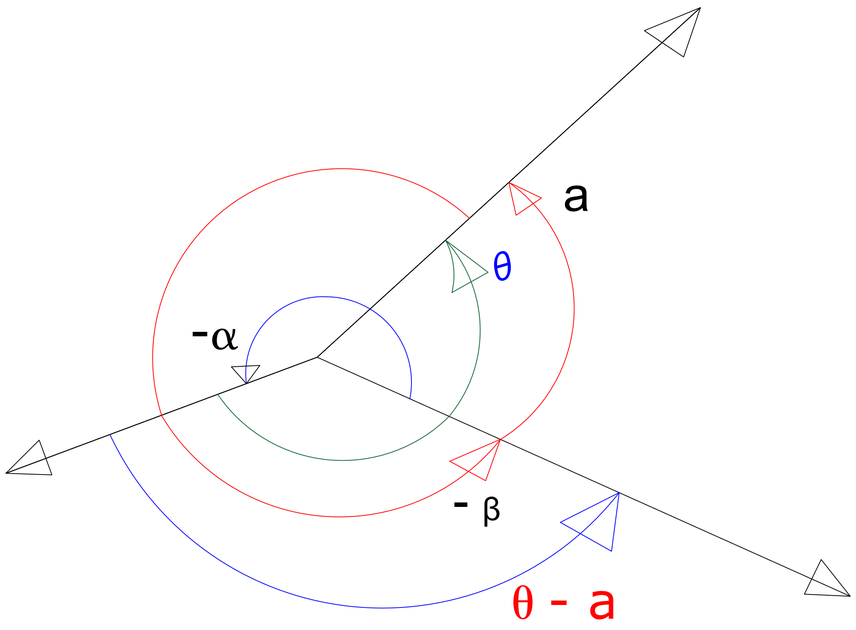
$\rightarrow 2x^\circ = 110^\circ \rightarrow x = 55^\circ$

Pregunta 5

Determinar una relación entre los ángulos "α" "β" "θ"



Resolución

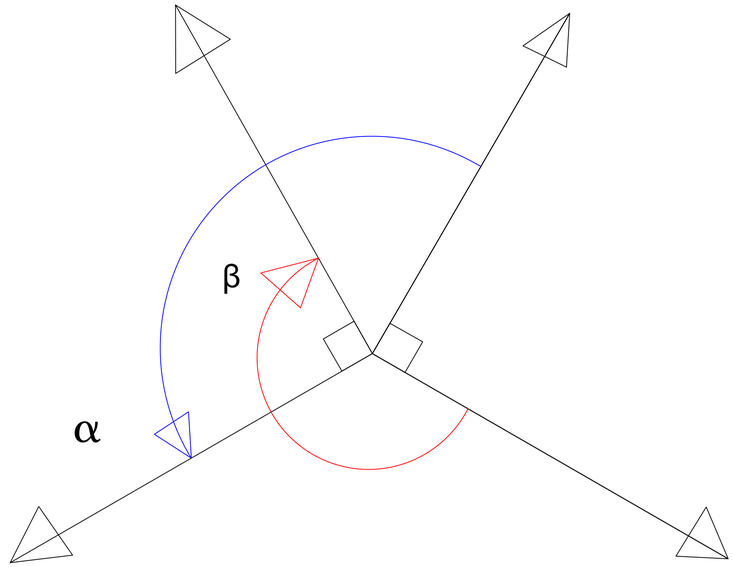


- β + a = 360°.....(1)

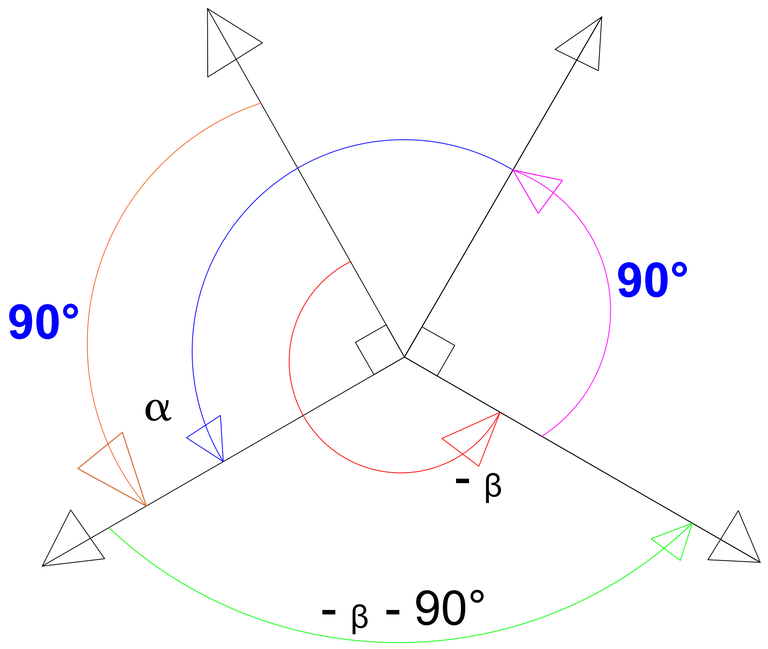
-α +θ -a = 360°....(2) → θ - β - α = 720°

Pregunta 6

Determinar una relación entre los ángulos "α" y "β"



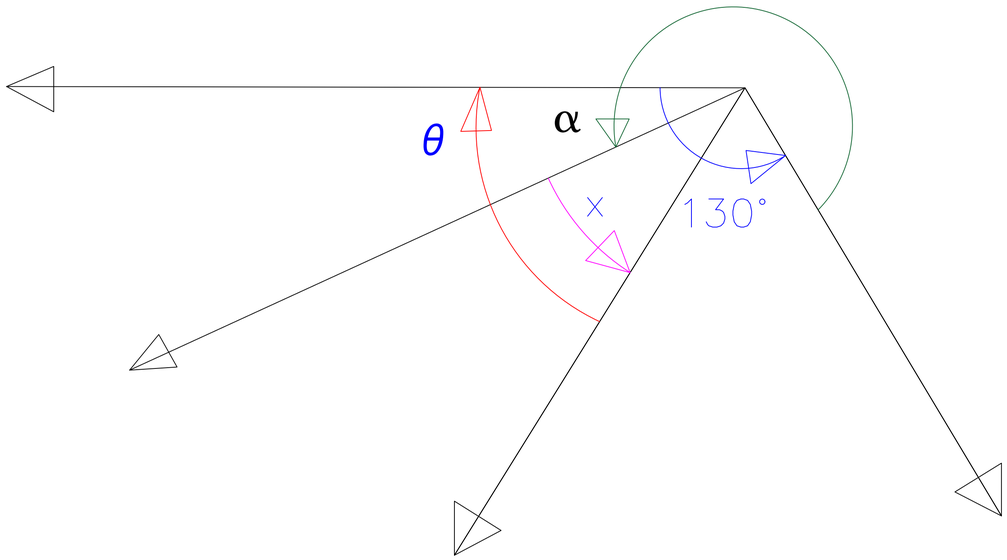
Resolución



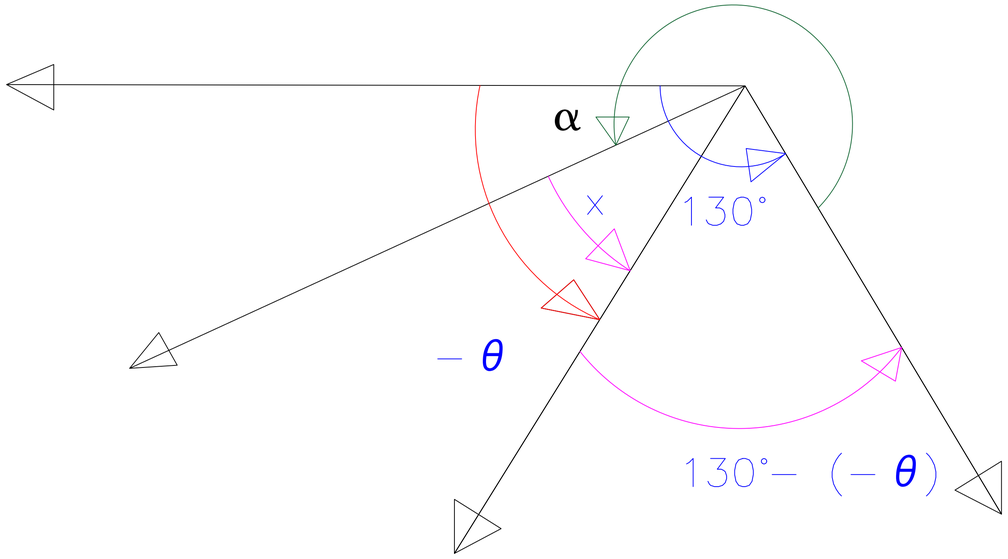
→ α- β = 360°

Pregunta 7

Halle "x" en términos de "α" y "θ"



Resolución

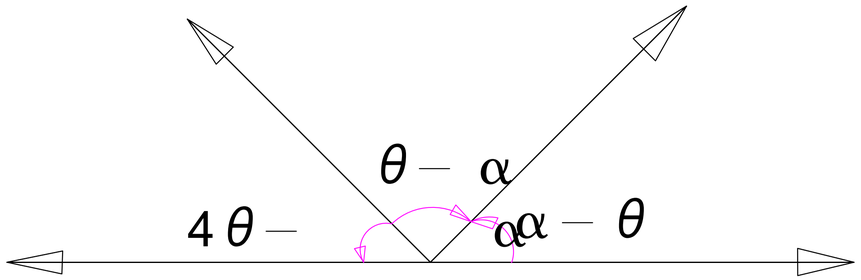


$\rightarrow \alpha + x + \theta = 360° - 130° \rightarrow x = 230° - \alpha - \theta$

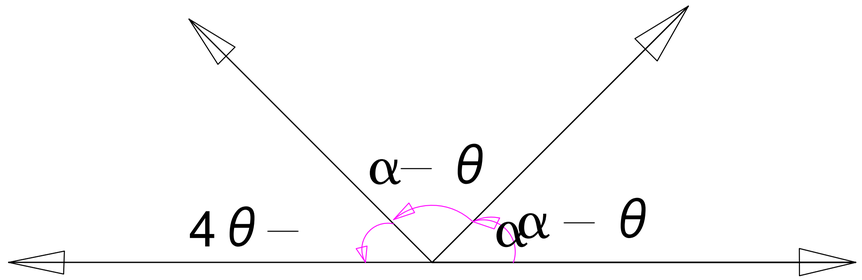
Práctica +
Práctica
=
Buenos Resultados

Pregunta 8

Del gráfico, halle el valor de "α" cuando "θ" toma su mínimo valor entero.



Resolución



$$\alpha + 2\theta = 180° \Rightarrow \alpha = 180° - 2\theta \quad ....(1)$$

$$\alpha - \theta > 0 \Rightarrow \alpha > \theta \quad .....(2)$$

$$4\theta - \alpha > 0 \Rightarrow 4\theta > \alpha \quad ..... .(3)$$

(1) en (3) $\Rightarrow 4\theta > 180° - 2\theta$

$\Rightarrow 6\theta > 180°$

$\Rightarrow \theta > 30°$

Dato: θ toma su mínimo valor entero, entonces:

$\theta_{mín} = 31°$

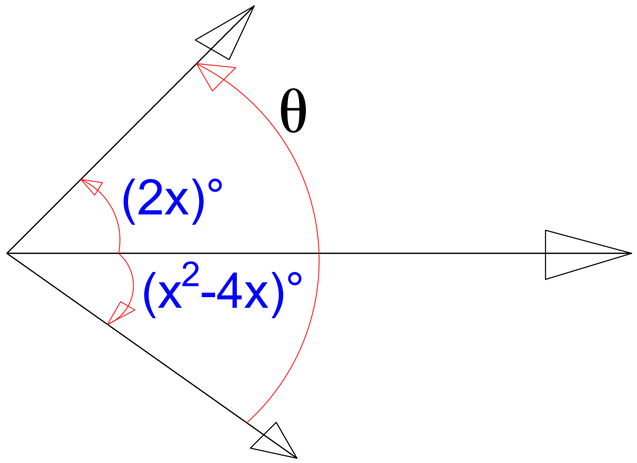
Reemplazando en (1), se tiene:

$\alpha = 180° - 2(31°)$

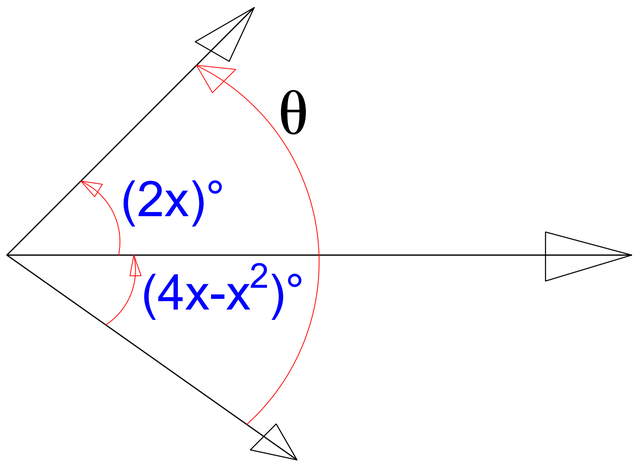
$\alpha = 180° - 62° = 118°$

Pregunta 9

Sabiendo que θ adopta su máximo valor, encuentra el complemento de x°.



a)27° b) 4° c) 3°
d) 86° e) 87°



Resolución

$\theta = 6x - x^2$

Derivamos con respecto al x

$0 = 6 - 2x$
$2x = 6$
$x = 3$

Complemento de 3 es 87 °

Rta: 87°