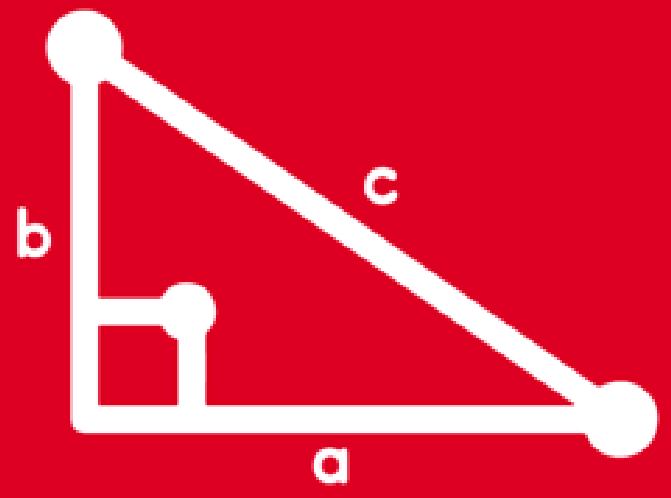
TRIGONOMETRY

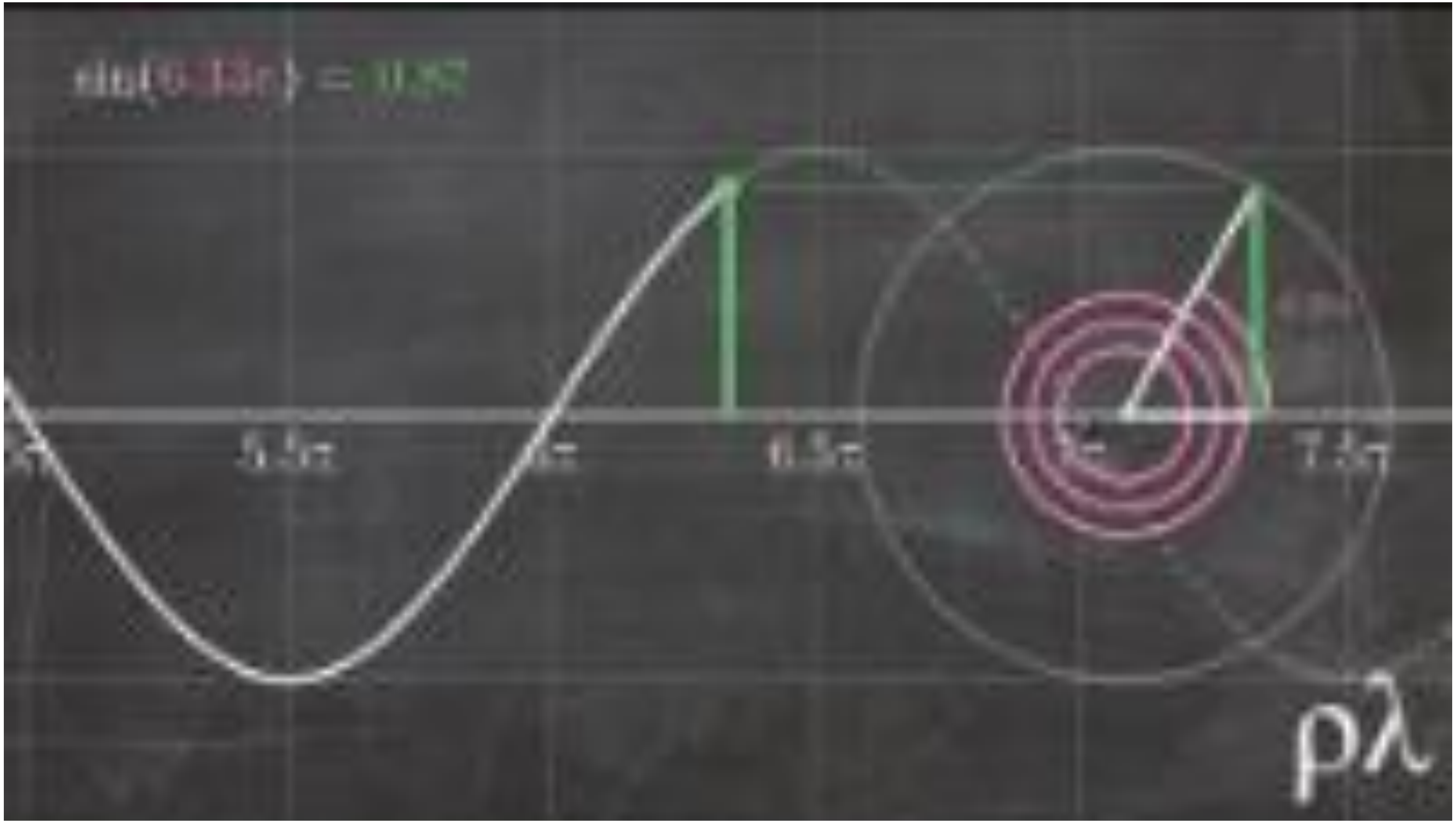
Chapter 15
Session 2



4th
SECONDARY

CIRCUNFERENCIA TRIGONOMÉTRICA II

SACO OLIVEROS

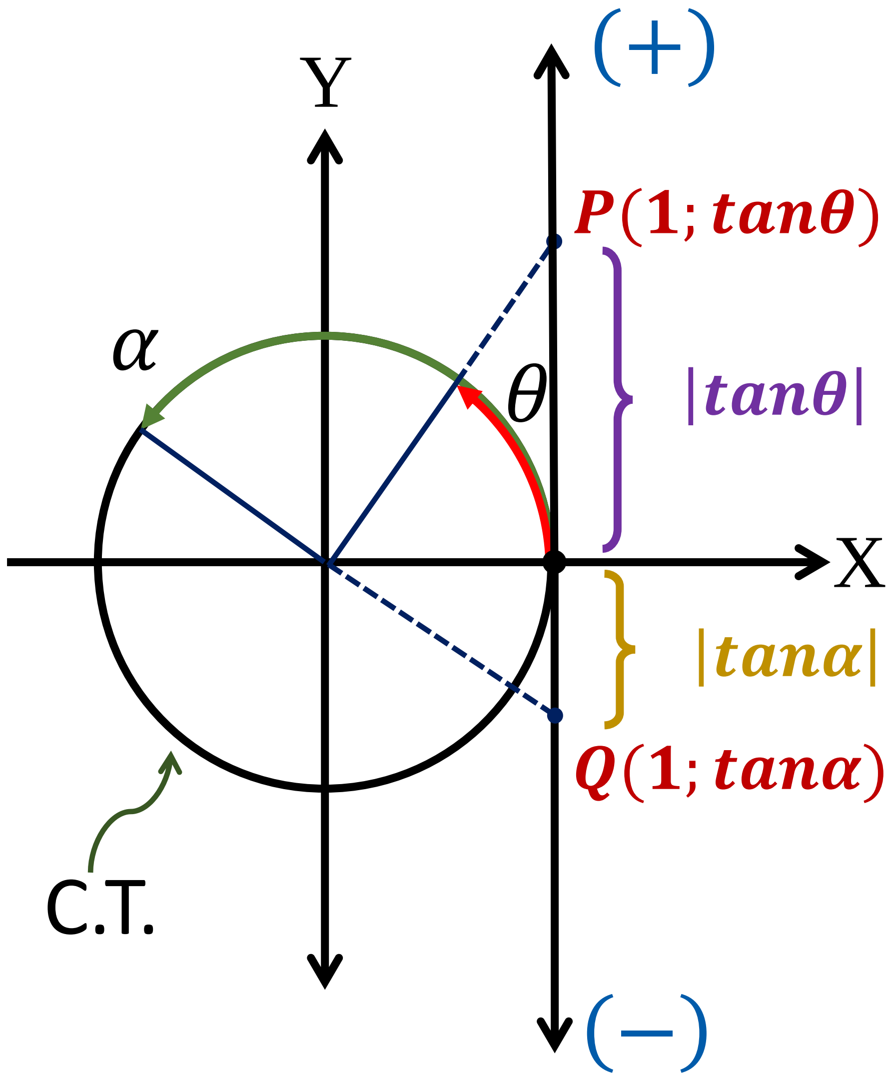

5.5π
6.5π
ρλ

Circunferencia trigonométrica

TANGENTE: Está representada en la C.T. por la ordenada del punto de intersección entre la recta tangente que pasa por el origen de arcos y la prolongación del radio que pasa por el extremo del arco .

$$\boldsymbol{tan\theta} \in \mathbb{R}$$

$$\boldsymbol{\theta} \in \mathbb{R} - \left\{ (\mathbf{2}\boldsymbol{n} + \mathbf{1})\frac{\boldsymbol{\pi}}{\mathbf{2}} \right\}; \boldsymbol{n} \in \mathbb{Z}$$



1. $\alpha \in$

$$\alpha = \frac{-}{\quad}$$

RESOLUCIÓN

$$\alpha \in IIC : tan\alpha < 0$$

$$\frac{2b-1}{4} < 0$$

$$2b - 1 < 0$$

$$b < \frac{1}{2}$$

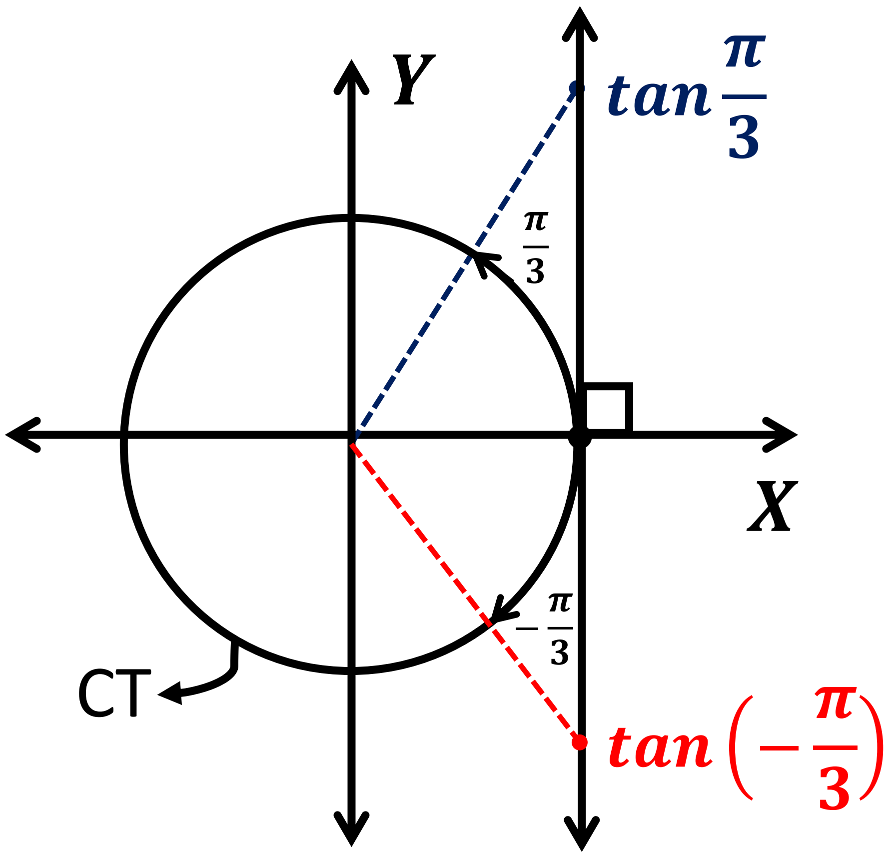
$$\boxed{\therefore\ \boldsymbol{b} \in \left\langle -\infty; \frac{\mathbf{1}}{\mathbf{2}} \right\rangle}$$

2.

$$\beta \in \left\langle -\frac{\pi}{} \quad \frac{\pi}{} \right\rangle$$

$^{2}\beta +$

RESOLUCIÓN



Del gráfico vemos:

$$tan\left(-\frac{\pi}{3}\right) < tan\beta < tan\frac{\pi}{3}$$

$$-\sqrt{3} < tan\beta < \sqrt{3}$$

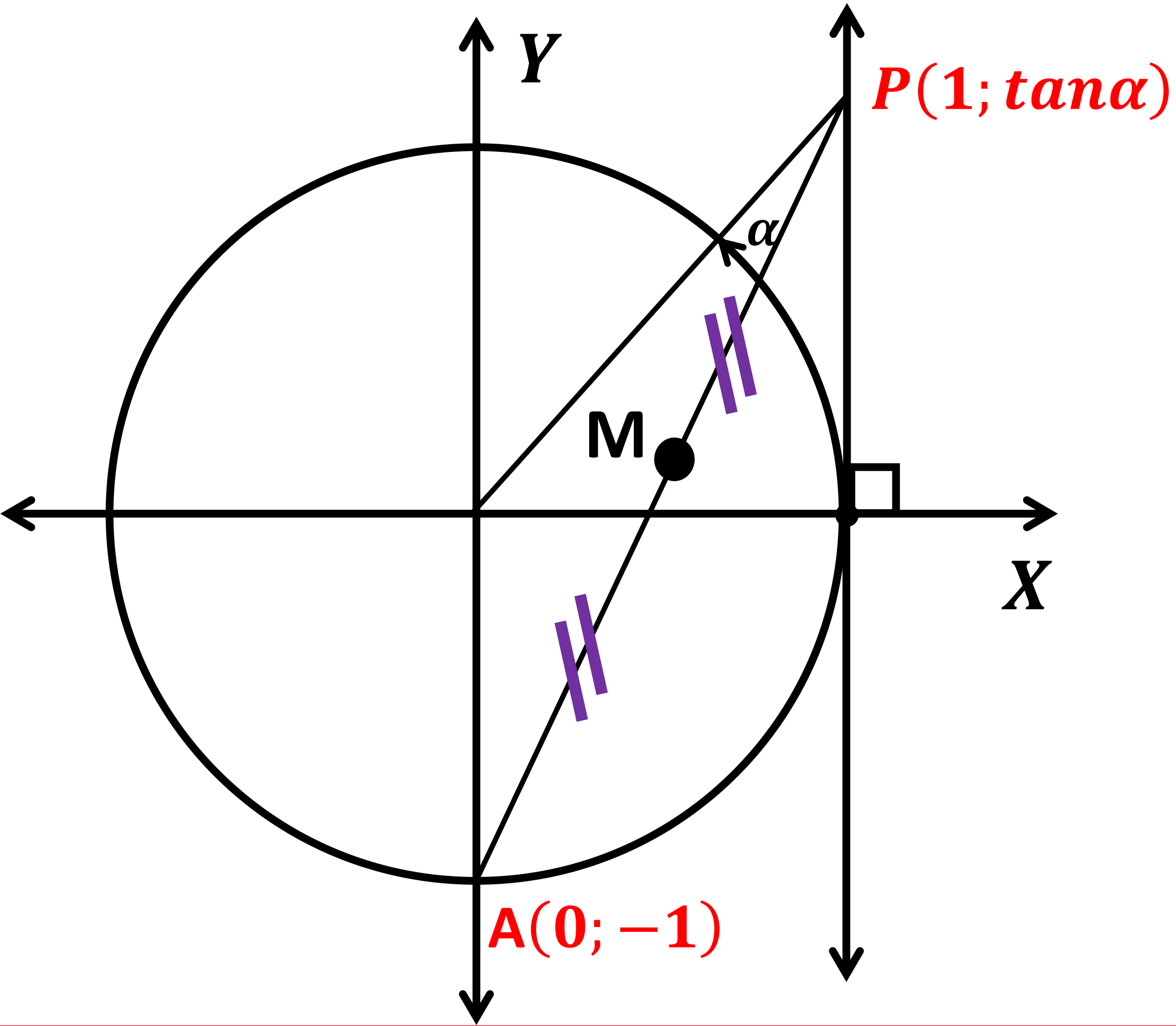
$$0 \leq tan^2\beta < 3$$

$$0 \leq 2tan^2\beta < 6$$

$$3 \leq \boldsymbol{2tan^2\beta + 3} < 9$$

$$\therefore \boldsymbol{M} \in [3; 9 >$$

3.



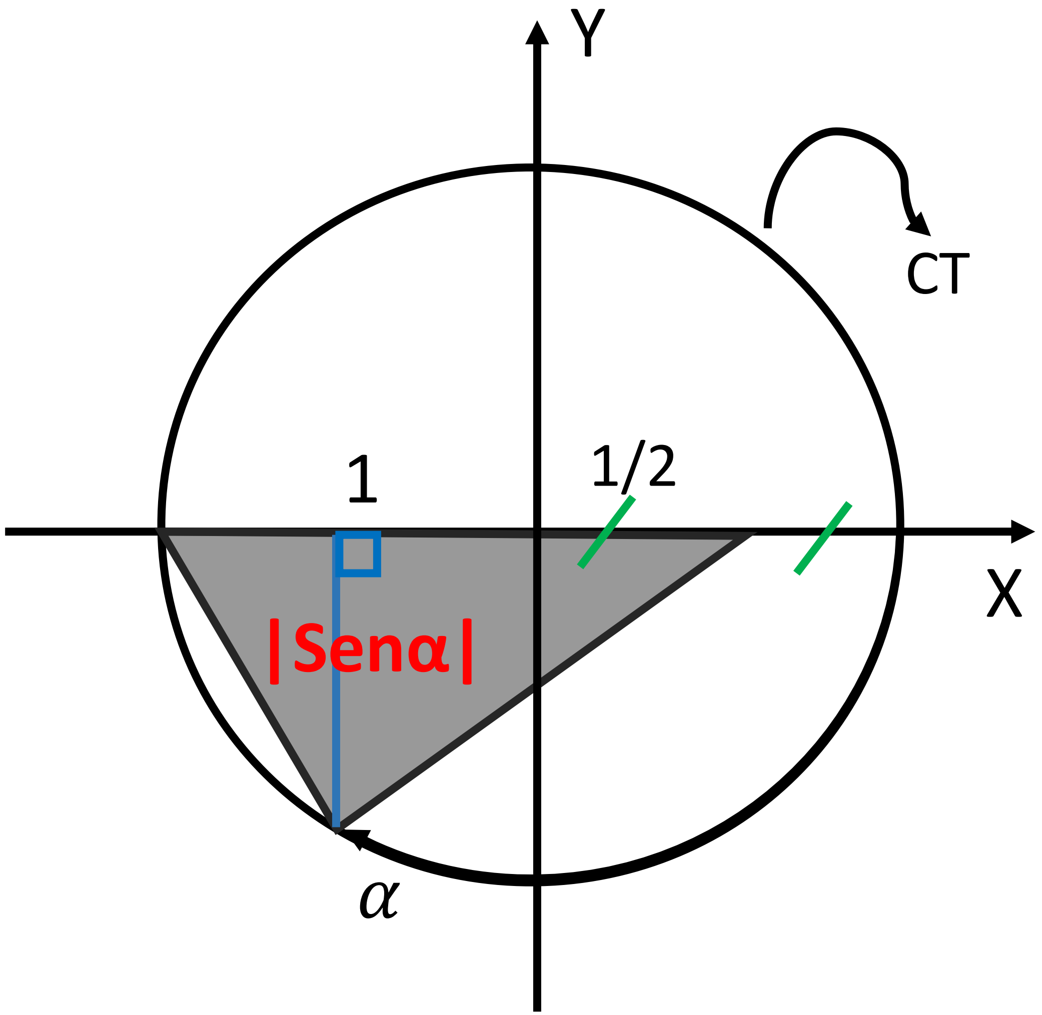
RESOLUCIÓN

Calculando el punto medio:

$$M\left(\frac{1+0}{2}; \frac{tan\alpha + (-1)}{2}\right)$$

$$\therefore\ M\left(\frac{1}{2}; \frac{tan\alpha - 1}{2}\right)$$

4.



RESOLUCIÓN

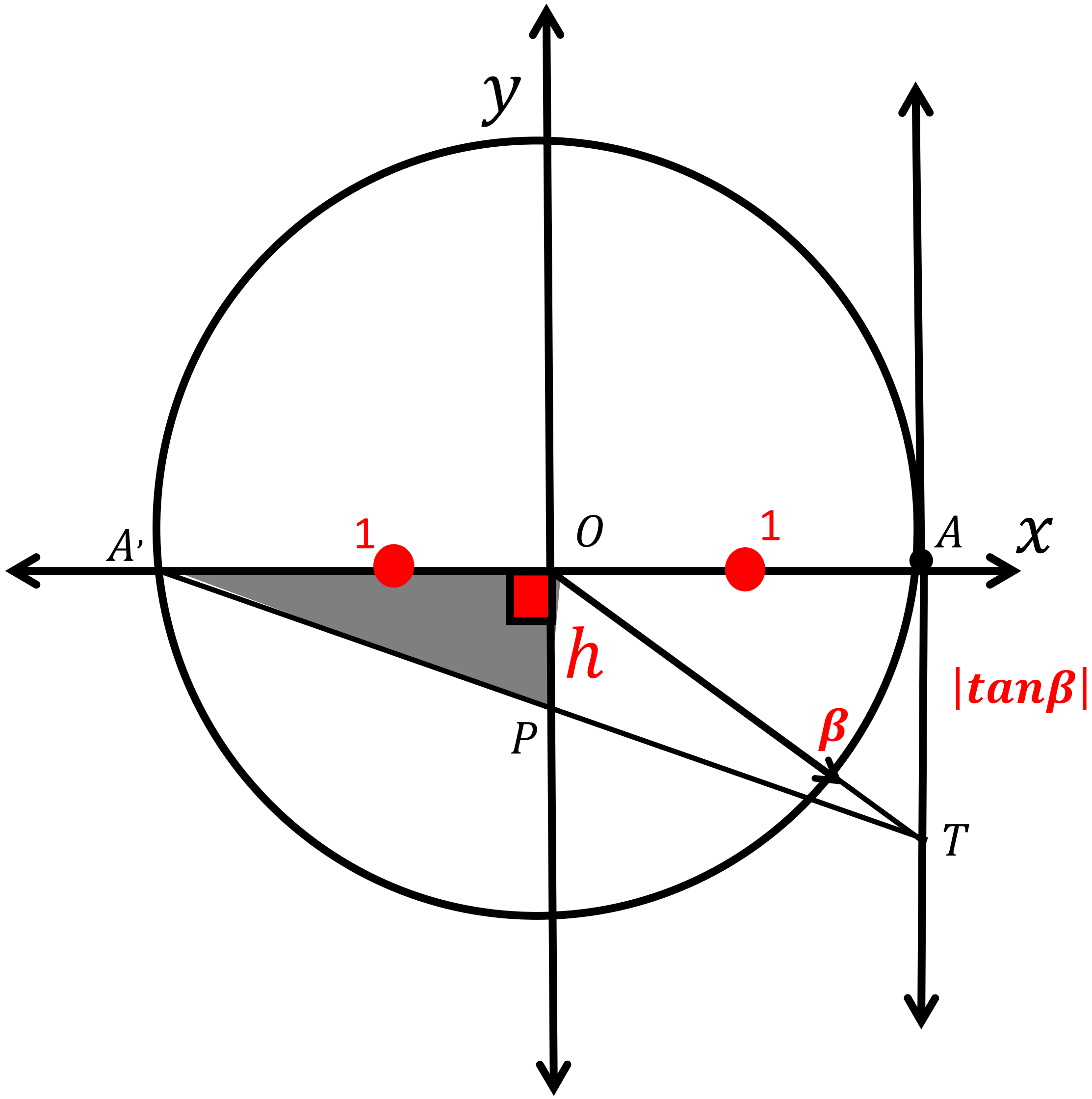
Sea S, el área sombreada:

$$S = \frac{\left(1+\frac{1}{2}\right)|\text{sen}\alpha|}{2}$$

$$S = \frac{3|\text{sen}\alpha|}{4}$$

Ahora como α ∈ IIIC ➡ $\text{sen}\alpha: (-)$

$$\boxed{\therefore\ S = -\frac{3\text{sen}\alpha}{4}u^2}$$



RESOLUCIÓN

$A'O = AO = 1 \Rightarrow AT = |tan\beta|$

$\Delta\, A'AT: \quad OP\ es\ Base\ Media$

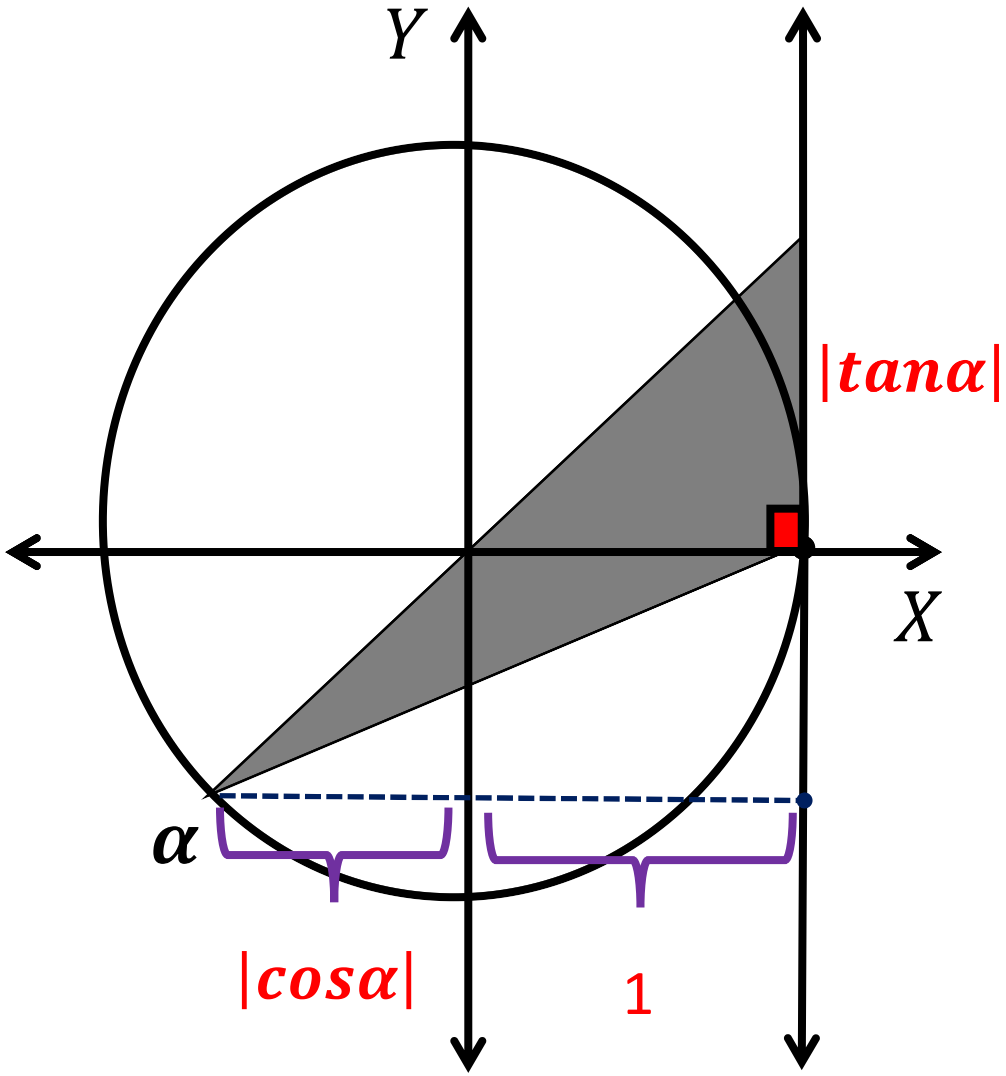
$OP = h \Rightarrow h = \dfrac{|tan\beta|}{2}$

$$Area_{\Delta A'OP} = \frac{(b)(h)}{2} = \frac{(1)\left(\frac{|tan\beta|}{2}\right)}{2}$$

$$Area = \frac{|tan\beta|}{4} \;;\; \beta \epsilon IVC$$

$\Rightarrow |tan\beta| = -\,tan\beta$

$$\therefore\ \boldsymbol{Area = \frac{-tan\beta}{4}}$$



RESOLUCIÓN

$b = |tan\alpha| \quad ; \quad h = 1 + |cos\alpha|$

$\alpha \epsilon IIIC \rightarrow |tan\alpha| = tan\alpha \; ; \; |cos\alpha| = -cos\alpha$

$$Area = \frac{(b)(h)}{2} = \frac{(tan\alpha)(1-cos\alpha)}{2}$$

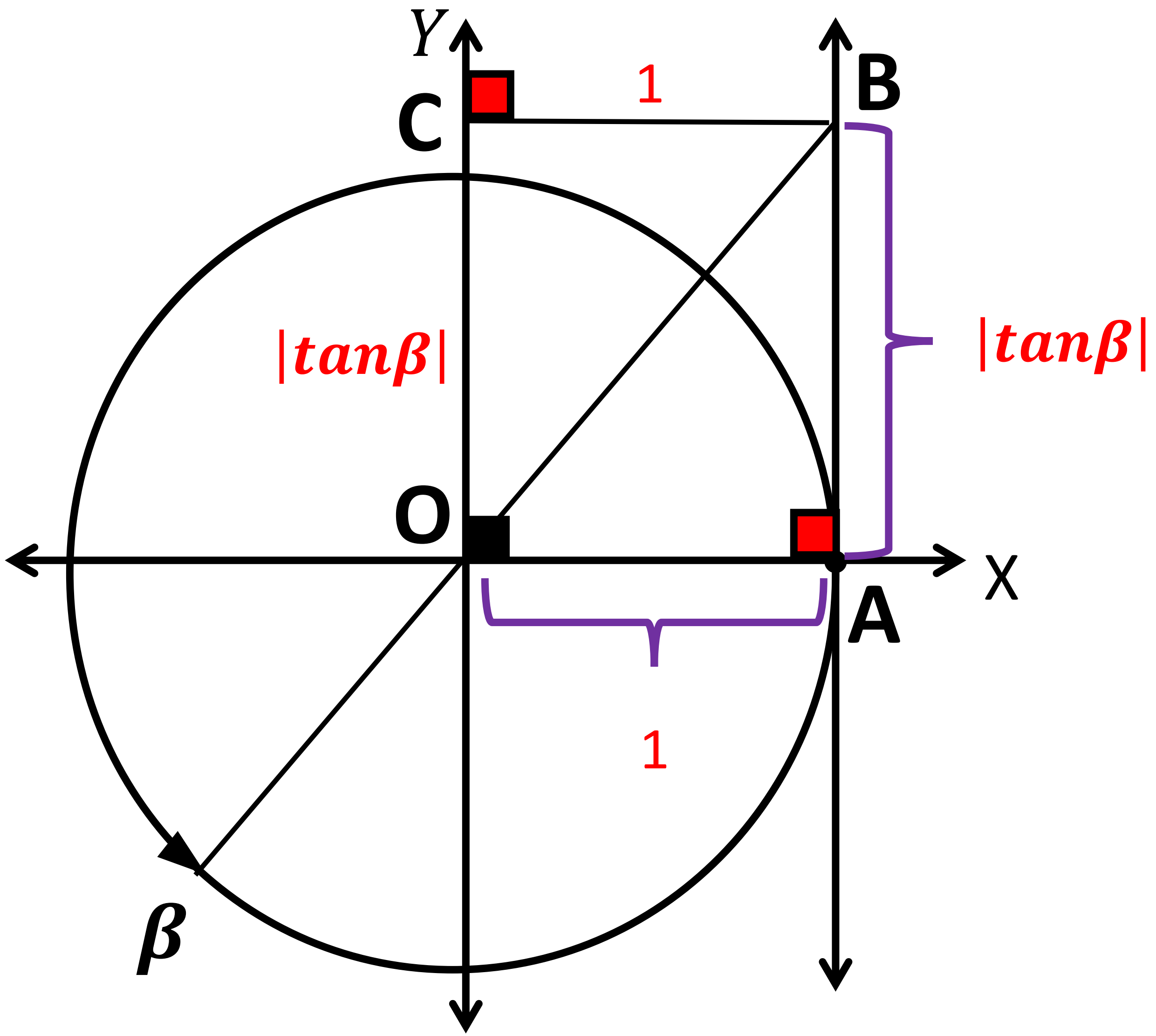
$$Area = \frac{tan\alpha - tan\alpha cos\alpha}{2}$$

$$Area = \frac{tan\alpha - \left(\frac{sen\alpha}{cos\alpha}\right)cos\alpha}{2}$$

$$Area = \frac{tan\alpha - sen\alpha}{2}$$

$$\boxed{\therefore \; Area = \frac{1}{2}(tan\alpha - sen\alpha)}$$

β



RESOLUCIÓN

$$OA = BC = 1 \;;\; AB = |tan\beta| \;;\; AB = OC$$

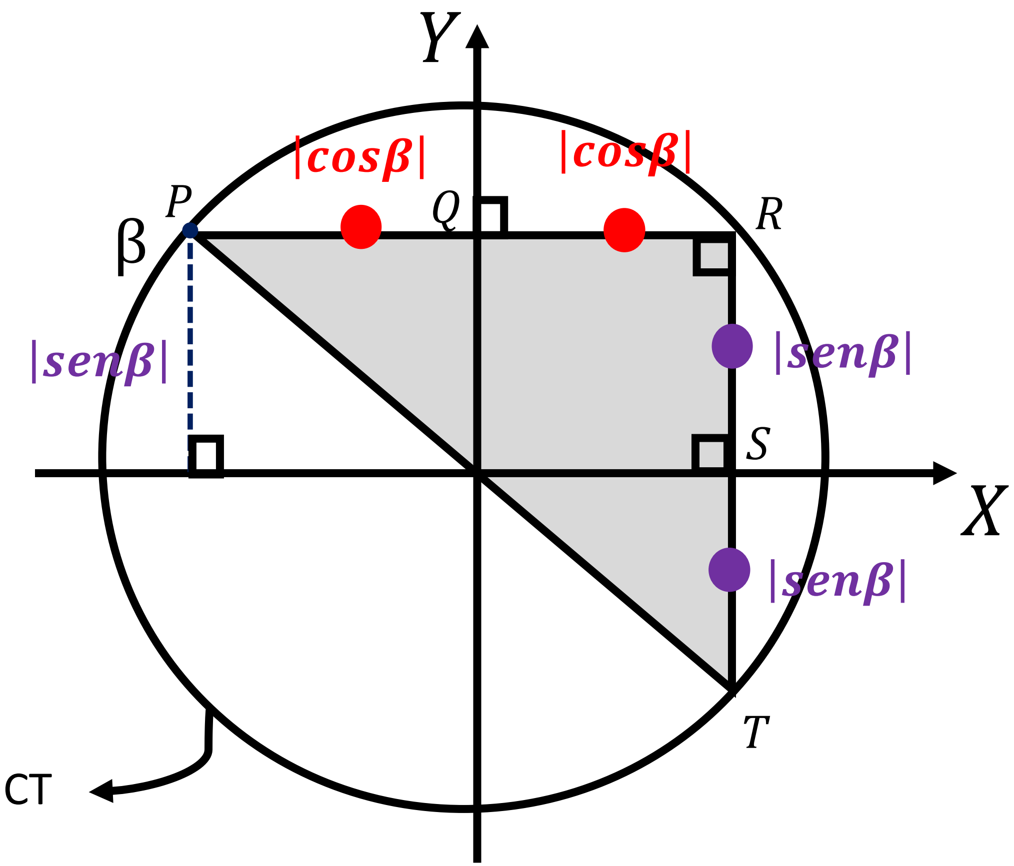
$$\beta \epsilon IIIC \;\rightarrow\; |tan\beta| = tan\beta$$

$$Perimetro = 2OA + 2AB$$

$$Perimetro = 2(1) + 2(tan\beta)$$

$$Perimetro = 2(1 + tan\beta)$$

$$\boxed{\therefore\ \boldsymbol{Perimetro = 2(1 + tan\beta)u}}$$



Si cada unidad de los ejes X e Y representan 1km.

a. ¿Cuál es el perímetro del terreno?

b. ¿Cuál es el área del terreno?

RESOLUCIÓN

$Propiedades: PQ = QR \ ; \ RS = ST$

$\beta \epsilon IIC \quad \rightarrow \quad |cos\beta| = -cos\beta \ ; \ |sen\beta| = sen\beta$

$Perimetro = PR + RT + PT$

$Perimetro = 2|sen\beta| + 2|cos\beta| + 2$

$Perimetro = 2sen\beta - 2cos\beta + 2$

$Perimetro = 2(sen\beta - cos\beta + 1)$

$$\therefore \boldsymbol{Perimetro = 2(sen\beta - cos\beta + 1)\ km}$$

$Area = \dfrac{(b)(h)}{2} \quad \Rightarrow \quad Area = \dfrac{(2|cos\beta|)(2|sen\beta|)}{2}$

$Area = 2(-cos\beta)(sen\beta)$

$$\therefore \boldsymbol{Area = -2cos\beta sen\beta\ km^2}$$