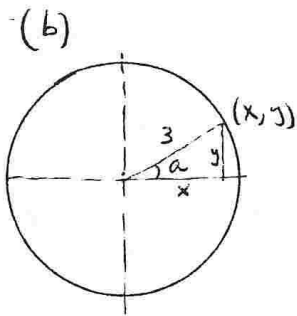


$$\text{Sen } \alpha = \frac{y}{3}$$

$$\frac{2}{3} = \frac{y}{3} \Rightarrow \boxed{y=2}$$

$$9 = x^2 + 4$$

$$x^2 = 5 \Rightarrow \boxed{x = \sqrt{5}}$$



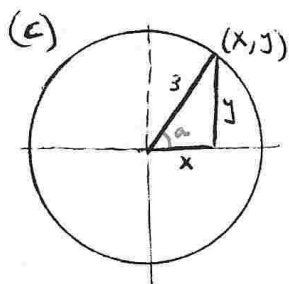
$$\text{Sec } \alpha = \frac{3\sqrt{2}}{2} \Rightarrow \text{Cos } \alpha = \frac{2}{3\sqrt{2}}$$

$$\text{Cos } \alpha = \frac{x}{3}$$

$$\frac{2}{3\sqrt{2}} = \frac{x}{3} \Rightarrow x = \frac{2}{\sqrt{2}} = \boxed{\sqrt{2}}$$

$$9 = (\sqrt{2})^2 + y^2 \Rightarrow y^2 = 7 \Rightarrow y = \boxed{\sqrt{7}}$$

$$\boxed{(\sqrt{2}, \sqrt{7})}$$



$$\text{Tg } \alpha = \frac{y}{x}$$

$$\frac{\sqrt{5}}{2} = \frac{y}{x} \Rightarrow y = \frac{\sqrt{5}}{2}x$$

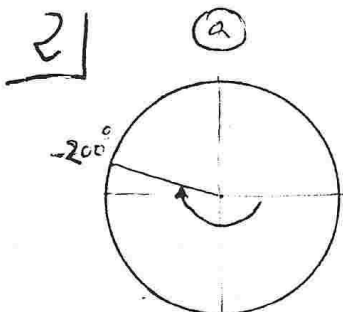
$$x^2 + y^2 = 9$$

$$x^2 + \frac{5x^2}{4} = 9 \Rightarrow \frac{9x^2}{4} = 9 \Rightarrow x^2 = 4 \Rightarrow \boxed{x=2}$$

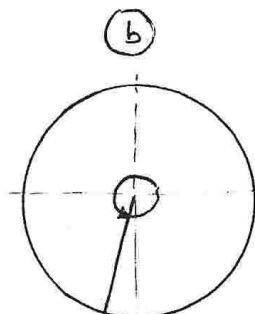
$$\downarrow$$

$$\boxed{y = \sqrt{5}}$$

$$\boxed{(2, \sqrt{5})}$$

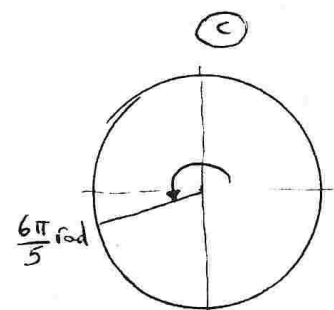


SENO	+
COSENO	-
TANG.	-



$$\frac{3487}{247} \quad \frac{360}{9}$$

SENO	-
COSENO	-
TANG	+



$$\frac{6\pi}{5} \text{ rad} \equiv \frac{6 \times 180^\circ}{5} = 216^\circ$$

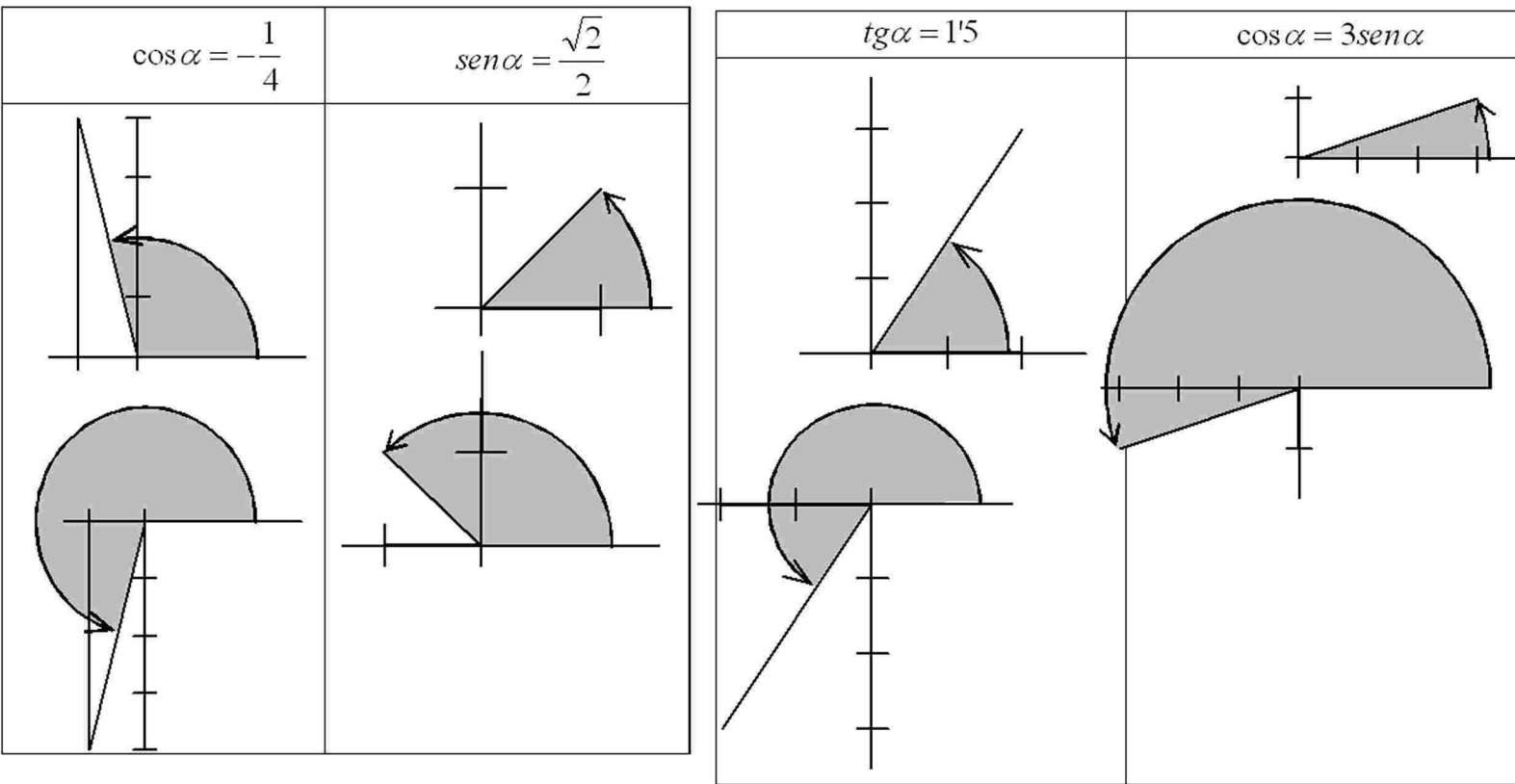
SENO	-
COSENO	-
TANG	+

3]

a)  $\cos \alpha = 2 \mid \Rightarrow \sin \alpha = \frac{1}{2} \Rightarrow \cos \alpha = \pm \sqrt{1 - \frac{1}{4}} = \boxed{-\frac{\sqrt{3}}{2}} \Rightarrow \sec \alpha = \boxed{-\frac{2}{\sqrt{3}}}$   
 $(\frac{\pi}{2} < \alpha < \pi)$   
 $\tan \alpha = \frac{1/2}{-\sqrt{3}/2} = \boxed{-\frac{1}{\sqrt{3}}} \Rightarrow \boxed{\operatorname{ctg} \alpha = -\sqrt{3}}$

b)  $\operatorname{ctg} \alpha = \frac{1}{3} \mid \Rightarrow \frac{\cos \alpha}{\sin \alpha} = \frac{1}{3} \Rightarrow \sin \alpha = 3 \cos \alpha \Rightarrow (3 \cos \alpha)^2 + \cos^2 \alpha = 1 \Rightarrow$   
 $\pi < \alpha < \frac{3\pi}{2}$   
 $\Rightarrow 10 \cos^2 \alpha = 1 \Rightarrow \cos \alpha = \boxed{-\frac{1}{\sqrt{10}}} \Rightarrow \sin \alpha = \boxed{-\frac{3}{\sqrt{10}}} \Rightarrow \boxed{\tan \alpha = 3}$   
 $\downarrow \downarrow$   
 $\boxed{\sec \alpha = -\sqrt{10}} \quad \boxed{\operatorname{cosec} \alpha = -\frac{\sqrt{10}}{3}}$

4]

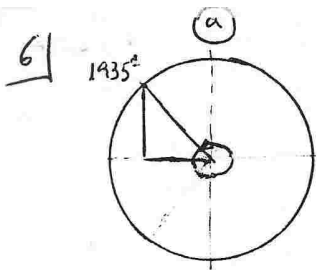


5]

$$\sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \frac{\sin^2 \alpha}{\sin^2 \alpha} + \frac{\cos^2 \alpha}{\sin^2 \alpha} = \frac{1}{\sin^2 \alpha} \Rightarrow 1 + \operatorname{ctg}^2 \alpha = \operatorname{cosec}^2 \alpha \Rightarrow$$

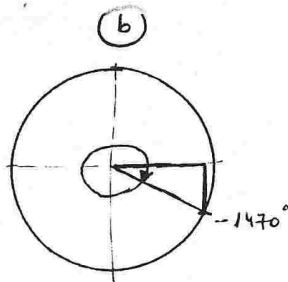
$$\Rightarrow \boxed{\operatorname{cosec} \alpha = \pm \sqrt{1 + \operatorname{ctg}^2 \alpha}} \Rightarrow \boxed{\sin \alpha = \frac{\pm 1}{\sqrt{1 + \operatorname{ctg}^2 \alpha}}} \Rightarrow \cos \alpha = \sin \alpha \cdot \operatorname{ctg} \alpha = \boxed{\frac{\pm \operatorname{ctg} \alpha}{\sqrt{1 + \operatorname{ctg}^2 \alpha}}} \Rightarrow$$

$$\Rightarrow \boxed{\sec \alpha = \frac{\pm \sqrt{1 + \operatorname{ctg}^2 \alpha}}{\operatorname{ctg} \alpha}} \quad \boxed{\tan \alpha = \frac{1}{\operatorname{ctg} \alpha}}$$



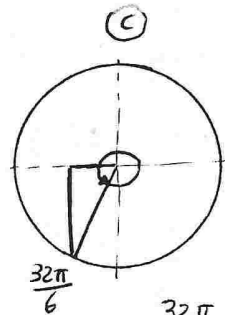
$$\frac{1935}{135} \quad \frac{360}{5}$$

$$\begin{aligned} \text{Sen } 1935^\circ &= \text{Sen } 135^\circ = \frac{\sqrt{2}}{2} \\ \text{Cos } 1935^\circ &= \text{Cos } 135^\circ = -\frac{\sqrt{2}}{2} \\ \text{Tg } 1935^\circ &= -1 \end{aligned}$$



$$\frac{1470}{30} \quad \frac{360}{4}$$

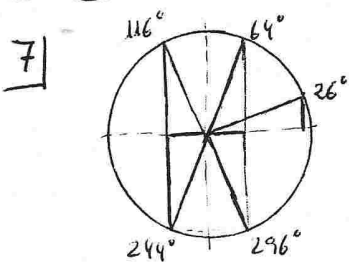
$$\begin{aligned} \text{Sen}(-1470^\circ) &= \text{Sen}(-30^\circ) = -\text{Sen } 30^\circ = -\frac{1}{2} \\ \text{Cos}(-1470^\circ) &= \text{Cos}(-30^\circ) = \text{Cos } 30^\circ = \frac{\sqrt{3}}{2} \\ \text{Tg}(-1470^\circ) &= -\frac{1}{\sqrt{3}} \end{aligned}$$



$$\frac{32\pi}{6} = \frac{32 \cdot 180}{6} = 960^\circ$$

$$\frac{960}{240} \quad \frac{360}{2}$$

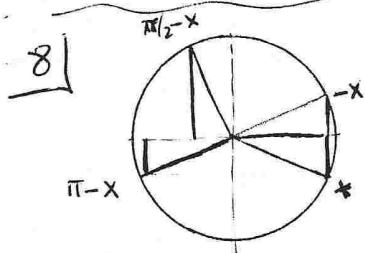
$$\begin{aligned} \text{Sen } \frac{32\pi}{6} &= \text{Sen } 240^\circ = -\frac{\sqrt{3}}{2} \\ \text{Cos } \frac{32\pi}{6} &= \text{Cos } 240^\circ = -\frac{1}{2} \\ \text{Tg } \frac{32\pi}{6} &= \sqrt{3} \end{aligned}$$



$$\text{Cosec } 296^\circ = -1.1 \Rightarrow \text{Sen } 296^\circ = -\frac{1}{1.1} = -0.91$$

$$\text{Cos } 296^\circ = -\sqrt{1 - (-0.91)^2} = +0.42$$

(a)	(b)	(c)	(d)
$\text{Sen } 64^\circ = 0.91$	$\text{Sen } 244^\circ = -0.91$	$\text{Sen } 26^\circ = 0.42$	$\text{Sen } 116^\circ = 0.91$
$\text{Cos } 64^\circ = 0.42$	$\text{Cos } 244^\circ = -0.42$	$\text{Cos } 26^\circ = 0.91$	$\text{Cos } 116^\circ = -0.42$



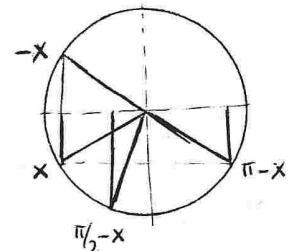
$$\text{Sen } x = -0.6 \Rightarrow x \in 3^\circ \text{ o } 4^\circ \text{ cuadrantes}$$

$$\text{Sen } x = -0.6$$

$$\text{Cos } x = \pm \sqrt{1 - (-0.6)^2} = \pm 0.8$$

$$x \in 3^\circ \text{ cuadrante}$$

$$x \in 4^\circ \text{ cuadrante}$$



(a)  $\text{Sen}(\frac{\pi}{2} - x) = \text{Cos } x = \boxed{0.8}$

(b)  $\text{Sen}(\pi - x) = \boxed{-0.6}$

(c)  $\text{Cos}(-x) = \text{Cos } x = \boxed{0.8}$

(a)  $\text{Sen}(\frac{\pi}{2} - x) = \boxed{-0.8}$

(b)  $\text{Sen}(\pi - x) = \boxed{-0.6}$

(c)  $\text{Cos}(-x) = \boxed{0.8}$

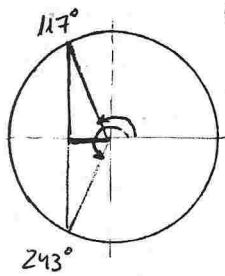
NOTA: Sin el dibujo, siguiendo las fórmulas:

$$\text{Sen}(\frac{\pi}{2} - x) = \text{Cos } x = \pm 0.8 \quad (\text{El signo depende del cuadrante})$$

$$\text{Sen}(\pi - x) = \text{Sen } x = -0.6 \quad (\text{Signo - sin que dependa del cuadrante})$$

$$\text{Cos}(-x) = \text{Cos } x = \pm 0.8 \quad (\text{El signo depende del cuadrante})$$

9



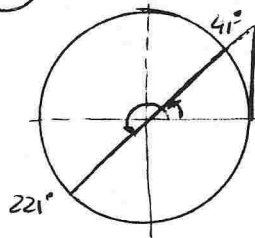
a

$$\alpha = 117^\circ + m \cdot 360^\circ$$

$$\alpha = 243^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$

b



$$\alpha = 41^\circ + m \cdot 360^\circ$$

$$\alpha = 221^\circ + m \cdot 360^\circ$$

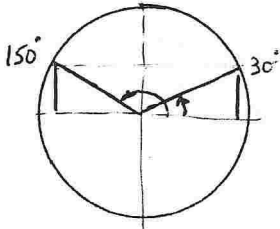
$$m \in \mathbb{Z}$$

O también:

$$\alpha = 41^\circ + m \cdot 180^\circ$$

$$m \in \mathbb{Z}$$

c

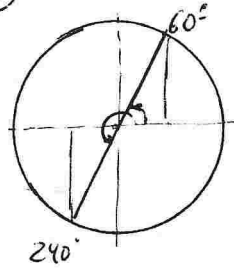


$$\alpha = 30^\circ + m \cdot 360^\circ$$

$$\alpha = 150^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$

d



$$\alpha = 60^\circ + m \cdot 360^\circ$$

$$\alpha = 240^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$

O también:

$$\alpha = 60^\circ + m \cdot 180^\circ$$

$$m \in \mathbb{Z}$$

10

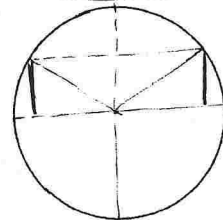
a

$$\sin x = 0.5983 \Rightarrow$$

$$x = 37^\circ + m \cdot 360^\circ$$

$$x = 143^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$



b

$$\operatorname{tg} x = 0.47960 \Rightarrow$$

$$x = 26^\circ + m \cdot 360^\circ$$

$$x = 206^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$

O también:

$$x = 26^\circ + m \cdot 180^\circ$$

$$m \in \mathbb{Z}$$

c

$$\operatorname{ctg} x = -1.19572 \Rightarrow$$

$$x = -39.91$$



$$x = 320^\circ + m \cdot 360^\circ$$

$$x = 140^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$

O también:

$$x = 140^\circ + m \cdot 180^\circ$$

$$m \in \mathbb{Z}$$

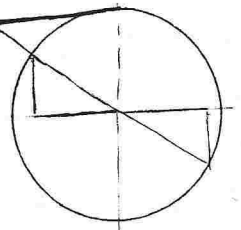
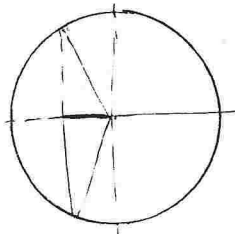
d

$$\cos x = -0.7583 \Rightarrow$$

$$x = 139^\circ + m \cdot 360^\circ$$

$$x = 221^\circ + m \cdot 360^\circ$$

$$m \in \mathbb{Z}$$



11) Las razones trigonométricas son cocientes de longitudes de lados de triángulo, por lo que son  $m^{\circ}$  reales, salvo aquellos casos en que, al anularse el denominador, la fracción no puede definirse. Por ejemplo:  $\operatorname{tg} 90^\circ$ ,  $\operatorname{cosec} 0^\circ$  etc

12

a)  $\cos x = -\frac{1}{2}$   $x = \begin{cases} 120 + 360k \\ 240 + 360k \end{cases}$

b)  $\sin x = 0$   $x = 0 + 180k$

c)  $\cos(2x - \pi) = -\frac{1}{2}$   $2x - 180 = \begin{cases} 120 + 360k \\ 240 + 360k \end{cases} \rightarrow 2x = \begin{cases} 300 + 360k \\ 420 + 360k \end{cases} \rightarrow x = \begin{cases} 150 + 180k \\ 210 + 180k \end{cases}$

d)  $\operatorname{tg} x = 1$   $x = 45 + 180k$

e)  $\operatorname{tg} x = -\sqrt{3}$   $x = \begin{cases} 120 + 360k \\ 300 + 360k \end{cases} = \boxed{120 + 180k}$

f)  $\operatorname{tg}(2x) = -1$   $2x = 135 + 180k \rightarrow x = 67.5 + 90k$

g)  $\sin(3x) = 1$   $3x = 90 + 360k \rightarrow x = 30 + 120k$

h)  $\operatorname{ctg} x + \frac{\sin x}{1 + \cos x} = 2 \rightarrow \frac{\cos x}{\sin x} + \frac{\sin x}{1 + \cos x} = 2 \rightarrow \cos x(1 + \cos x) + \sin^2 x = 2 \sin x(1 + \cos x) \rightarrow \cos x + \cos^2 x + \sin^2 x = 2 \sin x + 2 \sin x \cos x \rightarrow \cos x + 1 = 2 \sin x(1 + \cos x) \rightarrow (1 + \cos x)(1 - 2 \sin x) = 0$   
 $\rightarrow 1 + \cos x = 0 \rightarrow \cos x = -1 \rightarrow x = 180 + 360k$   
 $\rightarrow 1 - 2 \sin x = 0 \rightarrow \sin x = \frac{1}{2} \rightarrow x = \begin{cases} 30 + 360k \\ 150 + 360k \end{cases}$   
*Se anula el denominador  $1 + \cos x$*

i)  $\sin(\pi - 3x) = \frac{\sqrt{2}}{2} \rightarrow 180 - 3x = \begin{cases} 45 + 360k \\ 135 + 360k \end{cases} \rightarrow -3x = \begin{cases} -135 + 360k \\ -45 + 360k \end{cases}$

$\rightarrow x = \begin{cases} 45 - 120k \\ 15 - 120k \end{cases} = \begin{cases} 45 + 120k \\ 15 + 120k \end{cases}$

j)  $\sin x = \frac{\sqrt{3}}{2}$   $x = \begin{cases} 60 + 360k \\ 120 + 360k \end{cases}$

k)  $\cos(2x) = -1 \rightarrow 2x = 180^\circ + 360k \rightarrow x = 90 + 180k$

l)  $\operatorname{tg} x = -\frac{1}{\sqrt{3}}$   $x = \begin{cases} 150^\circ + 360k \\ 330^\circ + 360k \end{cases} \rightarrow x = 150 + 180k$