

①

TRABAJO PRACTICO 4

A)

1) No es función

Se viola la condición de que Todos los elementos del dominio tengan una imagen

2) No es función

Se viola la condición de que los elementos del dominio tengan una única imagen

3) No es función

Se viola la condición de que Todos los elementos del dominio tengan una imagen y que esa imagen sea única

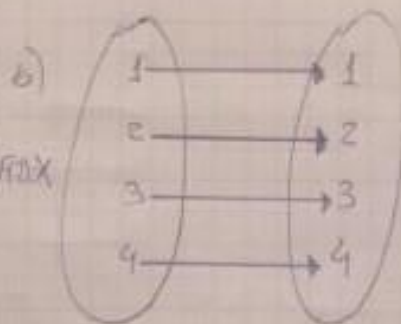
4) Si es función

B)

5)

a) ~~función~~

$$F: \{1, 2, 3, 4\} \rightarrow \{1, 2, 3, 4\} / \text{función}$$

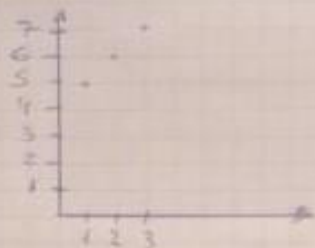


$$c) F: \{1, 2, 3, 4\} \rightarrow \{1, 2, 3, 4\}$$

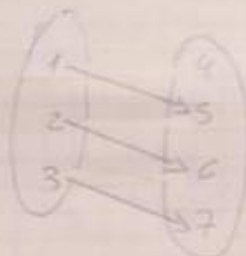
X	X
1	1
2	2
3	3
4	4

6)

a)



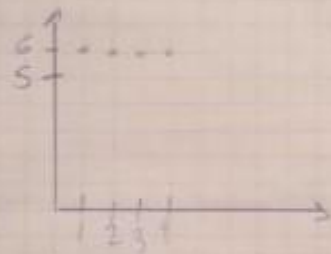
b)



c) $F: \{1, 2, 3\} \rightarrow \{4, 5, 6, 7\} / F(x) = x + 4$

7)

a)



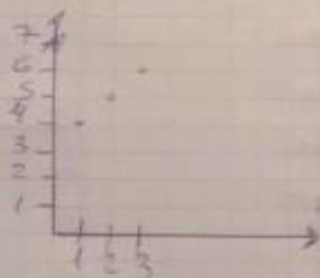
b) $F: \{1, 2, 3, 4\} \rightarrow \{5, 6, 7\}$

x	y
1	6
2	6
3	6
4	6

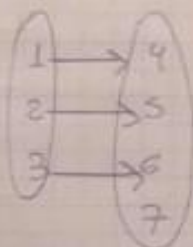
c) $F: \{1, 2, 3, 4\} \rightarrow \{5, 6, 7\} / F(x) = 6$

8)

a)



b)



c) $F: \{1, 2, 3\} \rightarrow \{4, 5, 6, 7\}$

x	y
1	4
2	5
3	6

②

c)

9) Si es función

10) No es función

Se viola la condición de que todos los elementos del dominio tengan una imagen

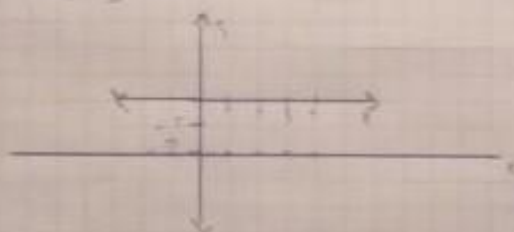
11) No es función

Se viola la condición de que todos los elementos del dominio tengan una imagen y que sea única

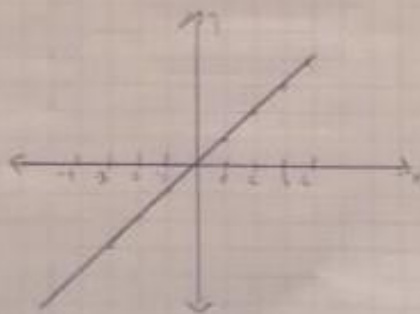
12) Si es función

13)

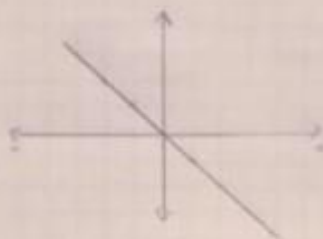
a) $y = -2$



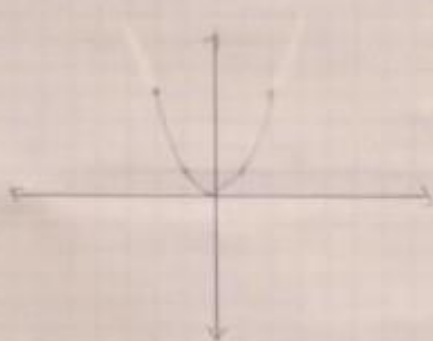
b) $y = x$



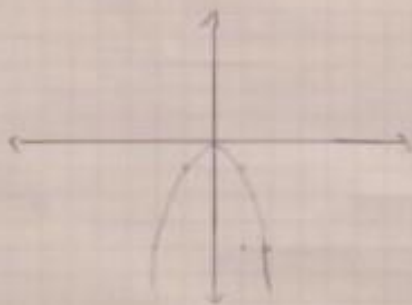
c) $y = -x$



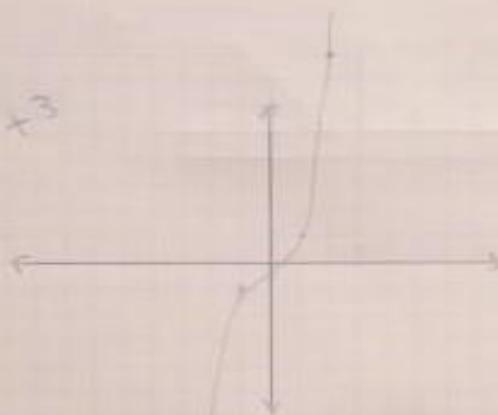
d) $y = x^2$



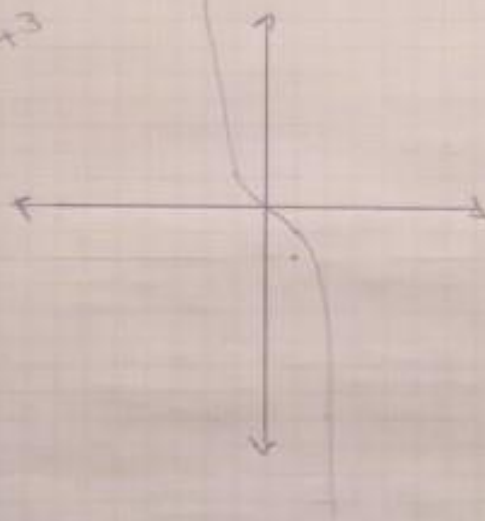
e) $y = -x^2$



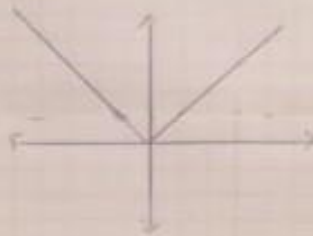
f) $y = x^3$



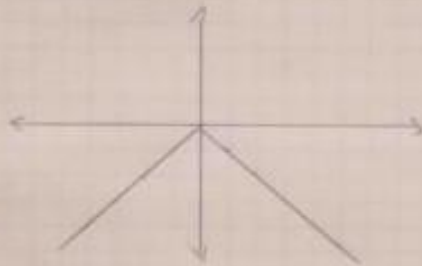
g) $y = -x^3$



$$h_f \quad y = |x|$$



$$1) \quad y = -|x|$$



1)

ii)

$$F(0) = 2$$

$$F(2) = 0$$

$$(0, 2), (2, 0)$$

$$F(x) = -\frac{1}{2}x + 2$$

$$\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1}$$

$$\frac{x - 0}{2 - 0} = \frac{y - 2}{0 - 2}$$

$$\frac{x}{2} = \frac{y - 2}{-2}$$

$$-\frac{1}{2}x = y - 2$$

$$x = -2y + 4$$

$$0 = x + y + 2$$

$$y = -x - 2$$

15) $F(-1) = 1$, $F(2) = 1$
 $(-1, 1)$, $(2, 1)$

$$\frac{x - (-1)}{2 - (-1)} = \frac{y - (+1)}{1 - 1}$$

NO TIENE SOLUCIÓN EN REALES

16) $F(-2) = 3$ n perpendicular $\Rightarrow F(x) = -3x + 1$

$$3 = (-3)(-2) + b$$

$$3 = +6 + b$$

$$-3 = b$$

$$-3 = b$$

$$F(x) = -3x - 3$$

17) $F(1) = -2$ n perpendicular $\Rightarrow F(x) = -\frac{1}{3}x + 1$

$$-2 = -\frac{1}{3} \cdot 1 + b$$

$$-2 + \frac{1}{3} = b$$

$$-\frac{5}{3} = b$$

$$F(x) = -\frac{1}{3}x - \frac{5}{3}$$

24)

$$A. F(x) = 50x \quad F(10) = 50 \cdot 10 = 500$$

$$B. F(x) = 20x + 0,5 \text{ km}$$

$$500 < 20 \cdot 10 + 0,5 \text{ km}$$

$$500 - 200 < 0,5 \text{ km}$$

$$300 \cdot \frac{1}{2} < 1$$

$$600 < 1 \text{ km}$$

Por lo tanto de los 600 km es más conveniente la opción A

23)

$$H_0 = 8000$$

$$H = 8560$$

$$20x = 200$$

$$16x = 600$$

$$7900 - 20$$

$$x - 1 = \frac{7900}{20} = 390$$

$$7960 - 16$$

$$x - 1 = \frac{7960}{16} = 497,5$$

$$V(x) = 8000 - 390x$$

$$V(x) = 8560 - 497,5x$$

el se devuelve más rápido

$$8000 - 390x = 8560 - 497,5x$$

$$-390x + 497,5x = 8560 - 8000$$

$$107,5x = 560$$

$$x = 560/107$$

$$x = 473$$

a)

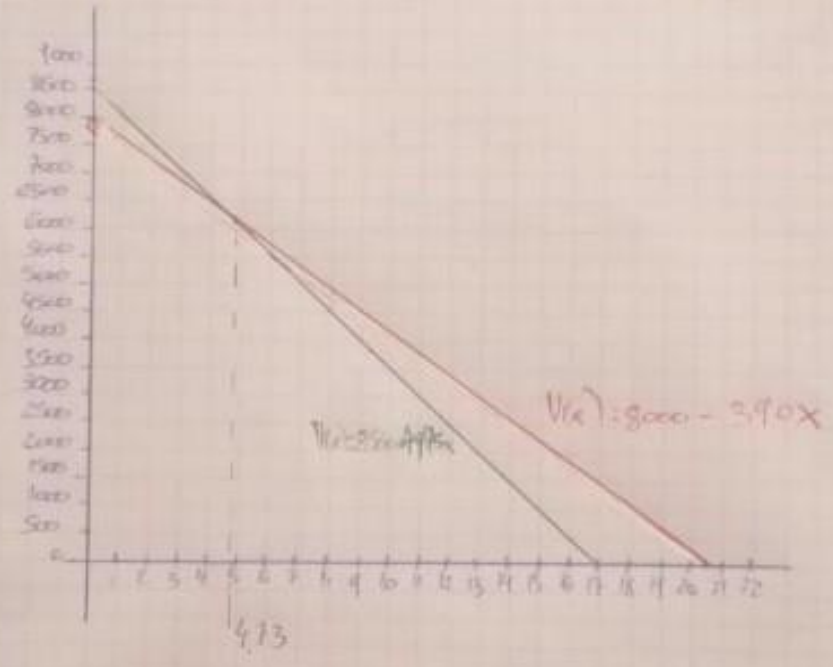
$$V(x) = 9000 - 390x$$
$$V(x) = 8560 - 497,5x$$

b) LA PIEZA QUE HOY VALE 8560 USD SE DEVALUARÁ MÁS RÁPIDO

c) DENTRO DE 4,73 AÑOS

d) NO, YA QUE ES UN SISTEMA COMPLETAMENTE DETERMINADO

c)



$$27) \quad a = T(F) = \frac{9}{5}x + 32$$

$$b = T(C) = \frac{9}{5}x - \frac{273}{5}$$

$$T(F) = \frac{9}{5}x + 32$$

$$0^{\circ}C = 32^{\circ}F$$

$$(0, 32)$$

$$(32, 0)$$

$$100^{\circ}C = 212^{\circ}F$$

$$(100, 212)$$

$$(212, 100)$$

$$a = \frac{212 - 32}{100 - 0} = \frac{180}{100} = 1.8$$

$$\frac{x - 0}{100 - 0} = \frac{y - 32}{212 - 32} = \frac{x}{100} = \frac{y - 32}{180}$$

$$\frac{x}{100} \cdot 180 = y - 32$$

$$y = 1.8x + 32$$

$$\frac{y - 32}{212 - 32} = \frac{y - 0}{100 - 0} = \frac{y - 32}{180} = \frac{y}{100}$$

$$100 \cdot \frac{y - 32}{180} = y$$

$$\frac{4}{9}(y - 32) = y$$

$$\frac{4}{9}x - \frac{273}{9} = y$$

K)

$$G4) F(x) = \frac{2x+3}{4}$$

Dom \mathbb{R}

$$CC \rightarrow \frac{2x+3}{4} = 0$$

$$2x = -3$$

$$x = -\frac{3}{2}$$

$$CN \rightarrow \frac{2x+3}{4} < 0$$

$$2x < -3$$

$$x < -\frac{3}{2}$$

$$CP \rightarrow \frac{2x+3}{4} > 0$$

$$x > -\frac{3}{2}$$

Dom $\mathbb{R} = \mathbb{R}$

$$CC = -\frac{3}{2} \quad / \quad CN = (-\infty, -\frac{3}{2}) \quad / \quad CP = (-\frac{3}{2}, +\infty)$$

G5)

$$F(x) = 7 - \frac{2-5x}{4}$$

Dom $= \mathbb{R}$

$$\frac{7-2-5x}{4} = 0$$

$$7 \cdot 4 = 2 - 5x$$

$$28 - 2 = -5x$$

$$- \frac{26}{5} = x$$

$$7 - \frac{2-5x}{4} > 0$$

$$7 > \frac{2-5x}{4}$$

$$28 - 2 > -5$$

$$-\frac{26}{5} < x$$

$$\text{Dom: } \mathbb{R} \quad \text{CC} = \left\{ -\frac{26}{5} \right\} / \text{CP} = \left(-\frac{26}{5}, +\infty \right) / \text{CU} = \left(-\infty, -\frac{26}{5} \right)$$

56)

$$f(x) = \frac{x+8}{x-3}$$

$$x-3=0 \quad \text{Dom: } \{\mathbb{R}-3\}$$

$$0 = \frac{x+8}{x-3}$$

$$0 < \frac{x+8}{x-3}$$

$$0 < x+8$$

$$0 = x+8$$

$$-8 < x$$

$$-8 = x$$

$$\text{Dom: } \mathbb{R} - \{3\} \quad \text{CC} = \{-8\} / \text{CP} = (-8, +\infty) / \text{CU} = (-\infty, -8)$$

57)

$$f(x) = 6 - |x+1|$$

$$0 = 6 - |x+1|$$

$$0 > 6 - |x+1|$$

$$|x+1| = 6$$

$$|x+1| > 6$$

$$x+1 = 6 \quad \vee \quad x+1 = -6$$

$$x+1 < 6 \quad \vee \quad x+1 > -6$$

$$x = 5$$

$$x = -7$$

$$x > 5$$

$$x > -7$$

$$x \leq 5$$

$$x \leq -7$$

$$\text{Dom: } \mathbb{R} \quad \text{CC} = \{5, -7\} / \text{CU} = (5, +\infty) \cup (-\infty, -7) /$$

$$\text{CP} = [-6, 4]$$

$$63) F(x) = \frac{|4x-8|-2}{3} - 5$$

$$0 = \frac{|4x-8|-2}{3} - 5$$

$$5 \cdot 3 = |4x-8|-2$$

$$17 = |4x-8|$$

$$4x-8 = 17$$

✓

$$4x-8 = -17$$

$$4x = 25$$

$$4x = -9$$

$$x = \frac{25}{4}$$

$$x = -\frac{9}{4}$$

$$0 > \frac{|4x-8|-2}{3} - 5$$

$$17 > |4x-8|$$

$$4x-8 < 17$$

✓

$$4x-8 < -17$$

$$x < \frac{25}{4}$$

$$x < -\frac{9}{4}$$

$$\text{Dom} = \mathbb{R} \quad \text{cc} = \left\{ -\frac{9}{4}, \frac{25}{4} \right\} / \text{CN} = \left(-\infty, \frac{25}{4} \right) / \text{CP} = \left(\frac{25}{4}, +\infty \right)$$

$$69) f(x) = x^2 - 3x$$

$$0 = x^2 - 3x$$

$$3x = x^2$$

$$\frac{3x^2}{x}$$

$$3 = x$$

$$0 = x^2 - 3x$$

$$3 = x$$

$$\text{Dom} = \mathbb{R} \quad \text{CC} \{3\} / \text{CP} = (-\infty, 3) / \text{CP} (3, +\infty)$$

70)

$$f(x) = x^3 - 7x^2 + 6x$$

$$0 = x^3 - 7x^2 + 6x$$

$$0 = x(x^2 - 7x + 6)$$

$$0 = x^2 - 7x + 6$$

$$\frac{-(-7) \pm \sqrt{(-7)^2 - 4 \cdot 1 \cdot 6}}{2 \cdot 1}$$

$$\frac{7 \pm \sqrt{49 - 24}}{2}$$

$$= \frac{7+5}{2} \quad \vee \quad \frac{7-5}{2}$$

$$6$$

$$1$$

	$(-\infty, 0)$	$(0, 1)$	$(1, 6)$	$(6, \infty)$
$f(x)$	-			
$f'(x)$				
$f''(x)$				
	-	+	-	+

Dom IR CC: $\{0, 1, 6\}$ / CU: $(-\infty, 0) \cup (1, 6)$ / CP: $(0, 1) \cup (6, \infty)$

7.1)

$$F(x) = x^4 - 8x^2 - 9$$

$$\begin{array}{r|rrrrr} 1 & 1 & 0 & -8 & 0 & -9 \\ & & 3 & 4 & 3 & 4 \\ \hline 3 & & & & & \end{array}$$

$$\begin{array}{r} 1 \ 3 \ 1 \ 3 \ 0 \\ (x^3 + 3x^2 + x + 3)(x - 3) \end{array}$$

72)

$$f(x) = 2x^3 - 7x^2 + 3x$$

$$0 = 12(2x^2 - 7x + 3)$$

$$= -(-7) \pm \sqrt{(-7)^2 - 4 \cdot 2 \cdot 3}$$

$$\frac{7 \pm \sqrt{49 - 24}}{4}$$

$$\frac{7 \pm \sqrt{25}}{4}$$

$$\frac{7+5}{4} = 3$$

$$\frac{7-5}{4} = \frac{1}{2}$$

	$(-\infty, 0)$	$(0, \frac{1}{2})$	$(\frac{1}{2}, 3)$	$(3, \infty)$
$(-\infty, 0)$				
$(0, \frac{1}{2})$				
$(\frac{1}{2}, 3)$				
$(3, \infty)$				
	-	+	-	+

$$\text{Dom} = \mathbb{R} \quad \text{CC} = \{0, \frac{1}{2}, 3\} / \text{CN} = (-\infty, 0) \cup (\frac{1}{2}, 3) / \text{CP} = (0, \frac{1}{2}) \cup (3, \infty)$$