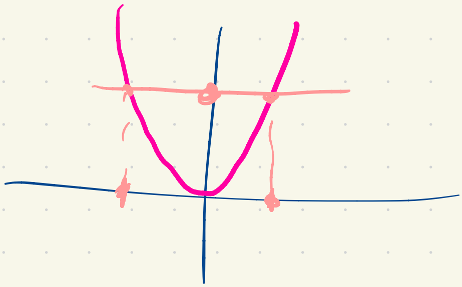
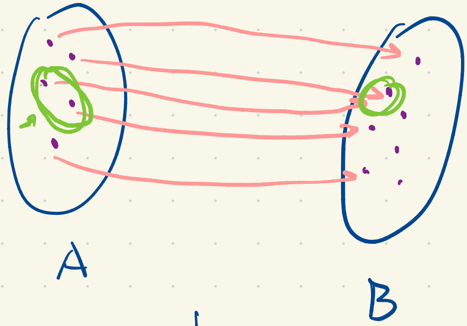
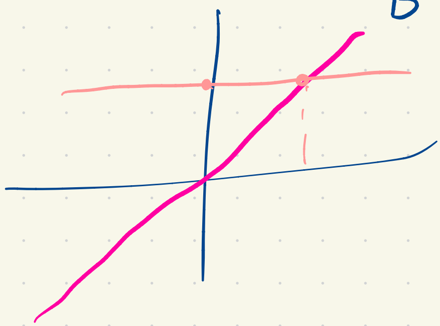
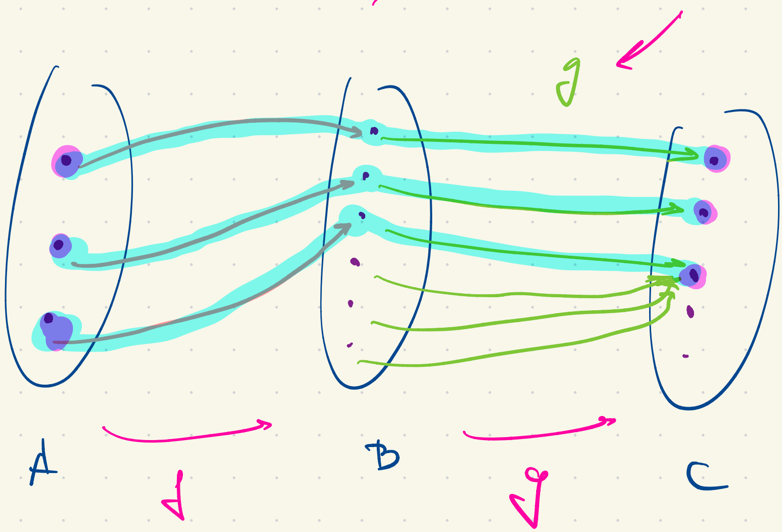
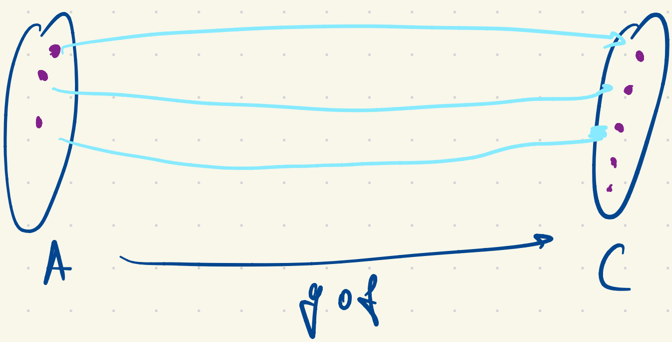
$$f: \underbrace{A}_{\text{Domino}} \to \underbrace{B}_{\text{Codominio}}$$







## Práctico 1. Sección 1:

**Ej 1, parte b)** $A = \{a, 1, v\}$. Calcular el conjunto potencia

Conjunto potencia: el conjunto que consiste en todos los subconjuntos de A.

$$\mathcal{P}(A) = \{\emptyset, \{a\}, \{1\}, \{v\}, \{a, 1\}, \{a, v\}, \{1, v\}, \{a, 1, v\}\}$$

$$\#\mathcal{P}(A) = 8 = 2^3 = 2^{\#A}$$

B conjunto.

$$\#\mathcal{P}(B) = 2^{\#B}.$$

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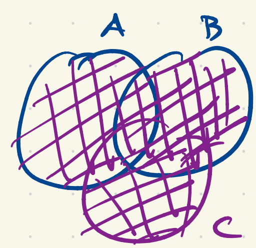
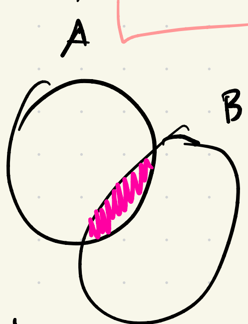
**Ej 2:** $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{3, 4, 5, 6, 7, 8\}$, $C = \{7, 8, 9, 10\}$

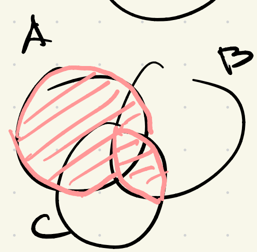



a) $\boxed{A \cap B = \{3, 4, 5, 6\}}$




h) $A \cup B \cup C = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

i) $\boxed{A \cup (B \cap C) = \{1, 2, 3, 4, 5, 6, 7, 8\}}$

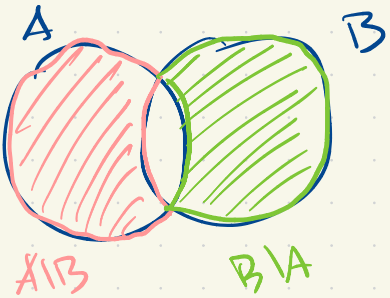



$B \cap C = \{7, 8\}$


$(A \cup B) \cap C \neq A \cup (B \cap C)$

e) $(A\setminus B)\cup(B\setminus A) = \{1,2\}\cup\{7,8\}$

$$\boxed{= \{1,2,7,8\}}$$




$$(A\setminus B)\cap(B\setminus A)=\emptyset$$

Ej 3: Determinar los siguientes conjuntos

a) $\{n\in\mathbb{N} : n\leq 5\} = \{0,1,2,3,4,5\}$

↳ Naturales

$\mathbb{N}=\{0,1,2,3,\dots\}$

b) $\underbrace{\{n\in\mathbb{N} : n^2\leq 12\}}_{\text{"por comprensión"}} = \underbrace{\{0,1,2,3\}}_{\text{"por extensión"}}$

c) $\{(-1)^n : n\in\mathbb{N}\} = \{1,-1\}$

d) $\{x\in\mathbb{R} : -x^2-x+2<0\}$

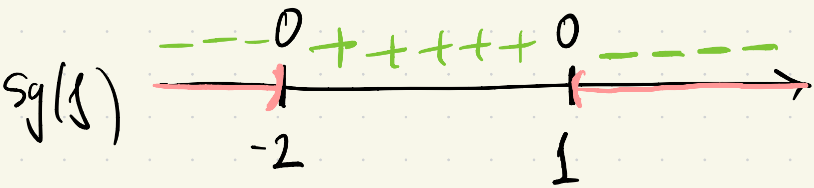
$-1$ es raíz evidente de $-x^2-x+2$.

| | | | |
|---|---|---|---|
| | $-1$ | $-1$ | $2$ |
| $1$ | | $-1$ | $-2$ |
| | $-1$ | $-2$ | $0$ |

$$\Rightarrow -x^2-x+2 = (x-1)(-x-2)$$

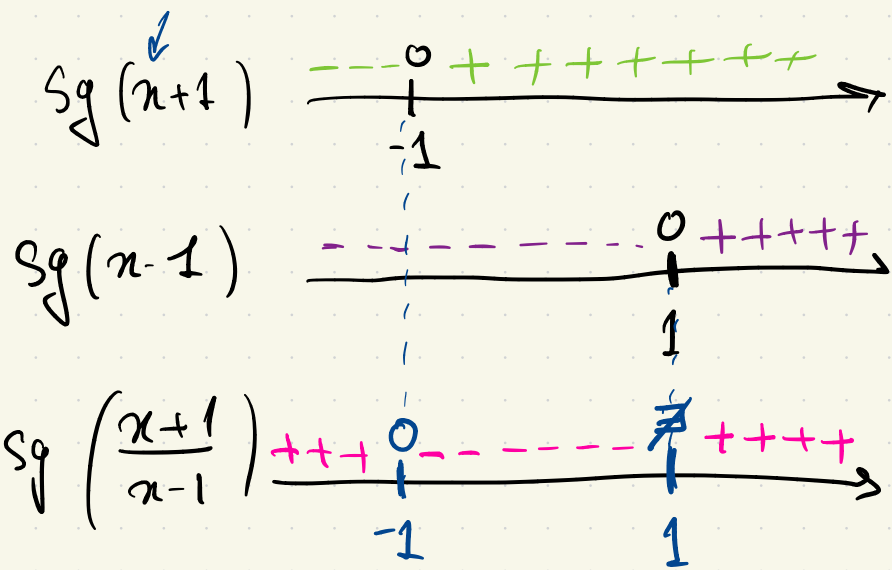
1 es raíz

$-2$ es raíz.




$$\Rightarrow \{x\in\mathbb{R} : -x^2-x+2\} = (-\infty,-2)\cup(1,+\infty)$$

g) $\{x\in\mathbb{R} : \frac{x+1}{x-1}\geq 0\} = [-\infty,-1]\cup(1,+\infty)$

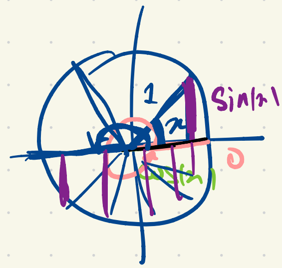


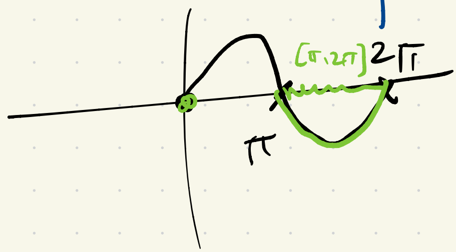
Ejemplo:

$$\{0,2,4,6,8,10\} = \{x = 2k : k \in \mathbb{N}, \ 0 \leq k \leq 5\}$$

1) $\{x \in [0, 2\pi] : \sin(x) \leq 0\}$

$$= \{0\} \cup [\pi, 2\pi]$$



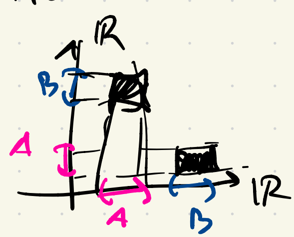

$$A \times B = \{(a,b) : a \in A, b \in B\}$$

Ejercicio 6: a) $A = \{1,2,3\}$, $B = \{a,b,c\}$.

Listar todos los elementos de $A \times B$ y $B \times A$.

$$A \times B = \{(1,a), (1,b), (1,c), (2,a), (2,b), (2,c), (3,a), (3,b), (3,c)\}$$

$$\#(A \times B) = 9 = 3 \times 3$$




$$B \times A = \{(b,a) : b \in B, a \in A\} = \{(a,1), (b,1), (c,1), \ldots\}$$

Ejemplo: $A = \{1, 2, 3\}$, $B = \{2, 3, 4\}$

$(2,3) \in A \times B$ ✓ $(1,2) \in A \times B$

$(2,3) \in B \times A$ $(1,2) \notin B \times A$

b) $A, B$ conjuntos cualesquiera. Probar que si $(x,y) \in A \times B$ y además $(x,y) \in B \times A$ entonces $\{x,y\} \subseteq A \cap B$.

<u>dem</u>: Sea $(x,y)$ tal que $(x,y) \in A \times B$ y $(x,y) \in B \times A$.

Como $(x,y) \in A \times B \overset{\text{Def. de } A\times B}{\Rightarrow} x \in A$ e $y \in B$.

Además, como $(x,y) \in B \times A \overset{\text{Def } B\times A.}{\Rightarrow} x \in B$ e $y \in A$

Tenemos $x \in A$ y $x \in B \overset{\text{Def de } A\cap B}{\Rightarrow} x \in A \cap B$.

Además, tenemos $y \in A$ e $y \in B$.

Entonces, por definición de $A \cap B$, tenemos que $y \in A \cap B$.

Como $x \in A \cap B$, e $y \in A \cap B$, concluimos que $\{x,y\} \subseteq A \cap B$.

$A, B \subseteq (0, +\infty)$

1) $1 \in A \cap B$

2) $\forall x \in A \; \exists y \in A \; / \; y < x$

3) $\forall x \in B \; \forall y > x, \; y \in B$