

Gráfica de relaciones

Intensivo UNI 2024 - III

1. La gráfica de la relación

$R = \{(x; y) \in \mathbb{R}/y^2 - xy - 2x^2 = 0 \vee xy - 4x - 3y + 12 = 0\}$
genera un cuadrilátero. Determine el área de dicho cuadrilátero.

A) $\frac{25}{2}$

B) 12

C) $\frac{23}{2}$

D) 11

E) $\frac{21}{2}$

si el área de la región que representa el conjunto C es $4,5 \text{ m}^2$, halle el conjunto de valores de h .

A) $\langle -3; 3 \rangle$

B) $\langle 0; 3 \rangle$

C) $\{3; -3\}$

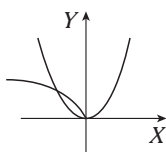
D) $[-3; 0]$

E) $\{4; -4\}$

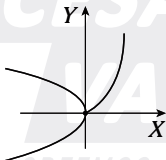
2. Determine la gráfica de la siguiente relación:

$f = \{(x; y) \in \mathbb{R}^2 / x = y^2 \vee x = \sqrt{y}\}$

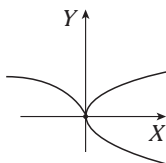
A)



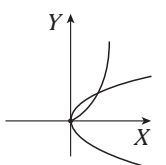
B)



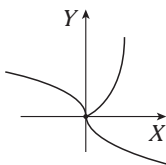
C)



D)



E)



4. Determine el área generada por la relación

$R = \{(x; y) \in \mathbb{R}^2 / x^2 + y^2 - 4x - 2y + 1 \leq 0 \wedge x + y - 3 \geq 0\}$

A) π

B) 2π

C) 4π

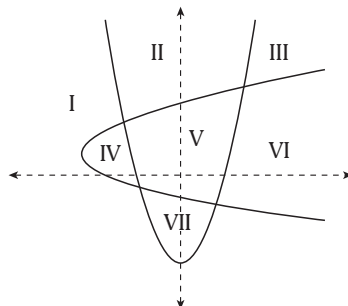
D) $\frac{3\pi}{2}$

E) $\frac{\pi}{2}$

5. Sea el siguiente sistema de inecuaciones:

$$\begin{cases} x^2 - y - 4 \geq 0 \\ x - y^2 + 2y + 3 \geq 0 \end{cases}$$

entonces, el conjunto solución está representado por la región



3. Dados los conjuntos

$A = \{(x; y) \in \mathbb{R}^2 / |x| \leq 3 \wedge |y| \leq 3\}$

$B = \{(x; y) \in \mathbb{R}^2 / y \geq |x - h|\}$

$C = A \cap B$

A) IV y VI

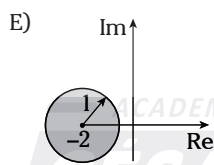
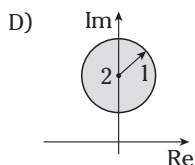
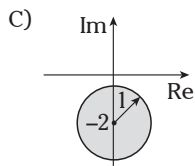
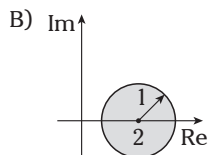
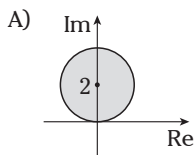
B) V

C) II y VII

D) I y III

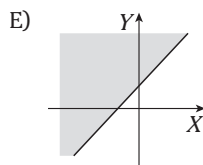
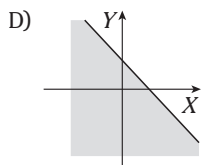
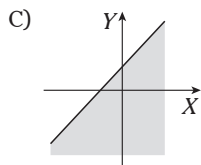
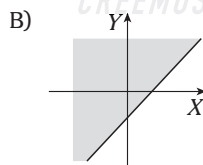
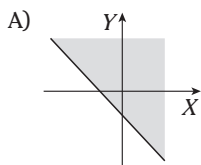
E) II y VI

6. Grafique la región determinada por todos los números complejos z , tal que $|z-2i| \leq 1$.



7. Determine la gráfica que mejor represente al conjunto

$$A = \{z - 1 + 2i \in \mathbb{C} / 2\operatorname{Im}(z) - 3\operatorname{Re}(z) \leq 3\}$$



8. Determine el número de puntos en común entre las gráficas de las relaciones siguientes:

$$f = \{(x; y) \in \mathbb{R}^2 / x = \sqrt{4-y^2}\}$$

$$g = \{(x; y) \in \mathbb{R}^2 / x = \sqrt{4-y}\}$$

A) 1

B) 2

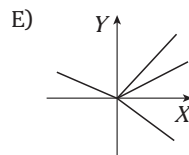
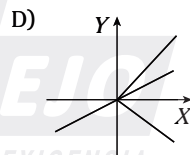
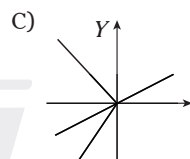
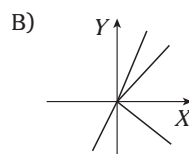
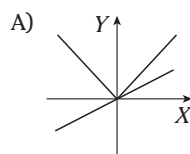
C) 3

D) 4

E) 5

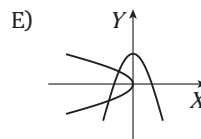
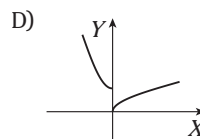
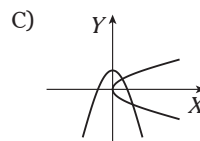
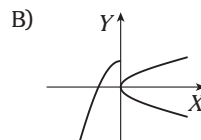
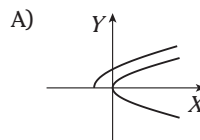
9. Determine la gráfica de

$$f = \{(x; y) \in \mathbb{R}^2 / (x-2y)(x-|y|) = 0\}$$



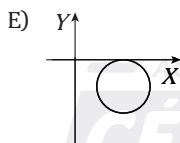
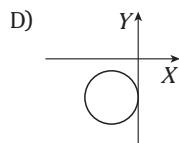
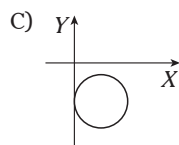
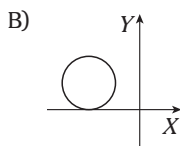
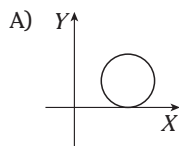
10. Determine la gráfica de la siguiente relación:

$$f = \{(x; y) \in \mathbb{R}^2 / (x-y^2)(x+\sqrt{1-y}) = 0\}$$



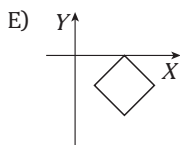
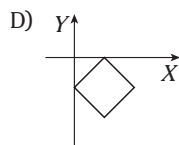
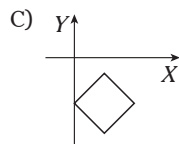
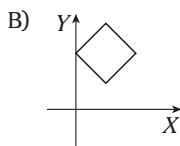
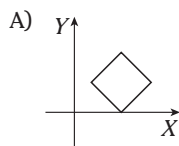
11. Determine la gráfica que mejor represente al conjunto

$$A = \{(x; y) \in \mathbb{R}^2 / x^2 + y^2 - 4x + 6y + 9 = 0\}$$



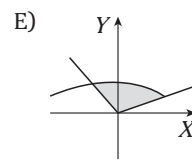
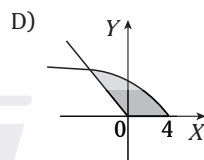
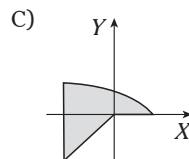
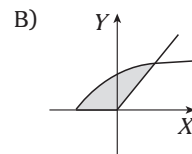
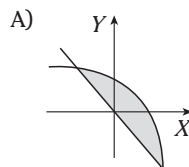
12. Determine la gráfica que mejor represente al conjunto

$$A = \{(x; y) \in \mathbb{R}^2 / |x - 2| + |y + 3| = 2\}$$



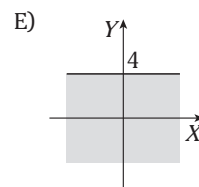
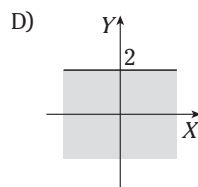
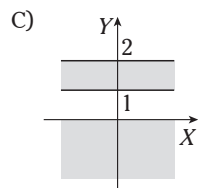
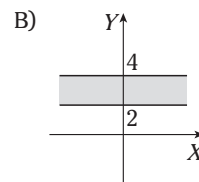
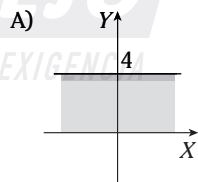
13. Determine todos los $(x; y) \in \mathbb{R}^2$, tal que

$$|x| - x \leq y \leq \sqrt{4 - x}$$

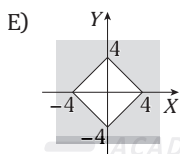
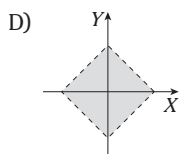
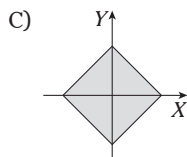
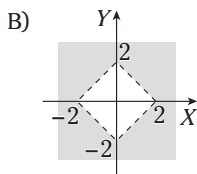
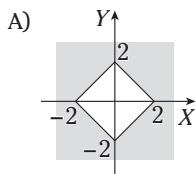


14. Determine la gráfica de la relación

$$R = \{(x; y) \in \mathbb{R}^2 / |y| + |y| \leq 4\}$$

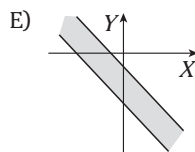
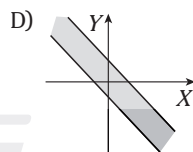
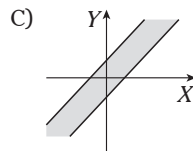
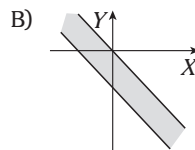
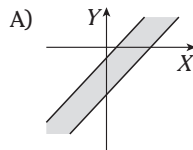


15. Sea $\|(x; y)\| = |x| + |y|$ para $(x; y) \in \mathbb{R}^2$. Determine la región C , donde $C = \{(x; y) : \|(x; y)\| \geq 2\}$.



17. Determine la gráfica de la siguiente relación:

$$A = \{(x; y) \in \mathbb{R}^2 : |y - 2x + 3| \leq 5\}$$

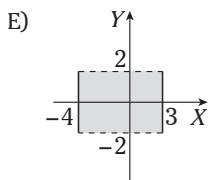
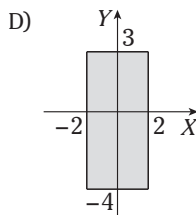
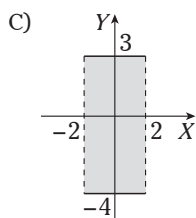
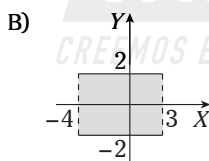
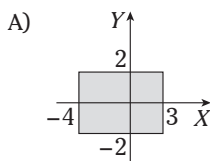


16. Dados los conjuntos

$$A = \{x \in \mathbb{R} : 2(x+3)(x-3) \leq (x+2)(x-3)\}$$

$$B = \{x \in \mathbb{R} : 4 - x^2 > 0\}$$

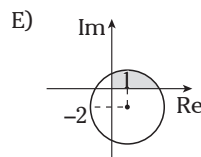
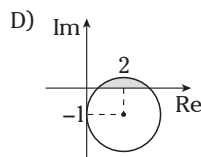
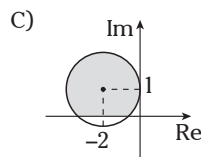
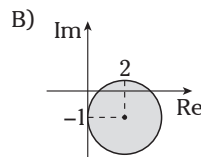
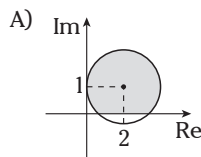
si $R = \{(x; y) \in \mathbb{R}^2 : x \in B \wedge y \in A\}$, halle la gráfica de R .



18. Determine todos los $z \in \mathbb{C}$, tal que cumplan las siguientes condiciones:

$$\bullet |z - 2 + i| \leq 2e^{\frac{\pi}{5}}$$

$$\bullet \arg(z) \in \left[0; \frac{\pi}{2}\right]$$



19. Determine el área de la región formada por la intersección de los siguientes conjuntos:

$$A = \{z \in \mathbb{C} / |z - 1 + i| \leq 2\}$$

$$B = \{z \in \mathbb{C} / \arg(z) \in [0; \pi]\}$$

- A) $\frac{2\pi}{3} - \sqrt{3} u^2$ B) $\frac{4\pi}{3} u^2$ C) $\frac{2\pi}{3} u^2$
D) $\frac{4\pi}{3} - \sqrt{3} u^2$ E) $\frac{5\pi}{3} - \sqrt{3} u^2$

20. Determine el mayor argumento del complejo

$$z \in N \text{ si}$$

$$N = \{z \in \mathbb{C} / |z - 10\sqrt{3} - 10i| \leq 10\}$$

- A) $\frac{\pi}{4}$ B) $\frac{\pi}{3}$ C) $\frac{2\pi}{3}$
D) $\frac{\pi}{2}$ E) π

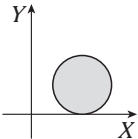
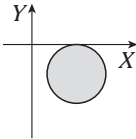
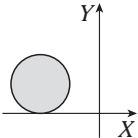
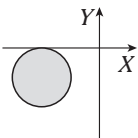
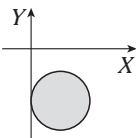
21. Si se tiene que

$$M = \{z \in \mathbb{C} / \operatorname{Im}(z) \geq \operatorname{Re}^2(z) - 4; \operatorname{Im}(z) \leq \operatorname{Re}^2(z) + 4\}$$

entonces determine el máximo valor de $|z_1 - z_2|$, tal que $z_1 \wedge z_2 \in M$.

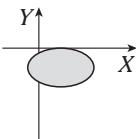
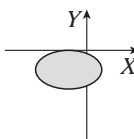
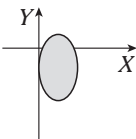
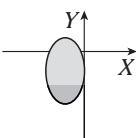
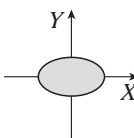
- A) 6 B) 9 C) 8
D) 7 E) 5

22. Si $M = \{\bar{z} + 1 - i \in \mathbb{C} / |z^* + 2 + i| \leq 2\}$, indique su gráfica.

- A)  B) 
C)  D) 
E) 

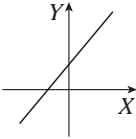
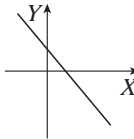
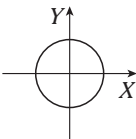
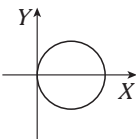
23. Determine la región que representa

$$A = \{z + 1 - i / |\operatorname{Re}(z) + 2\operatorname{Im}(z)i| \leq 2\}$$

- A)  B) 
C)  D) 
E) 

24. Grafique el siguiente conjunto:

$$A = \{z \in \mathbb{C} / \operatorname{Re}\left(z - \frac{1}{z}\right) = 0\}$$

- A)  B) 
C)  D) 
E) 