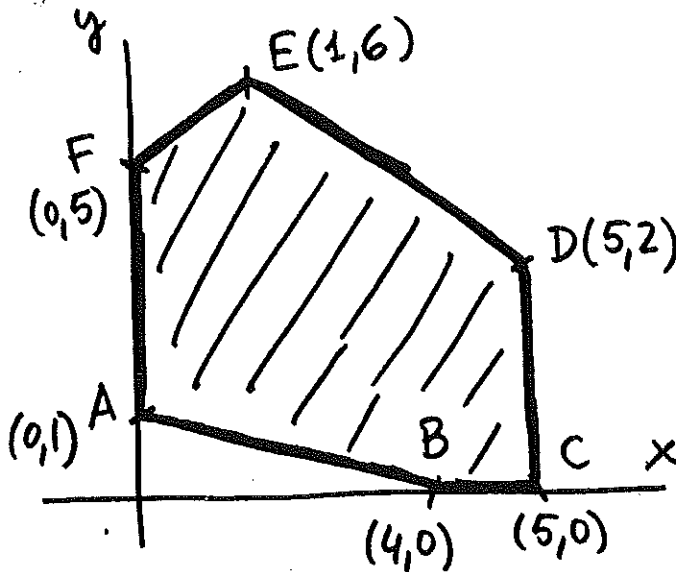


EJERCICIO 1.-

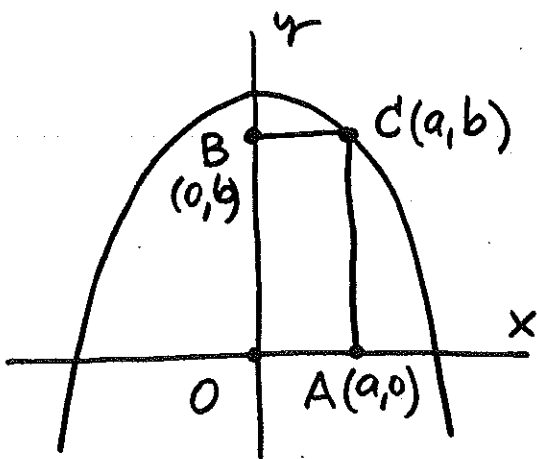


$$\begin{aligned} f(A) &= f(0,1) = 3,2 \\ f(B) &= f(4,0) = -1,6 \\ f(C) &= f(5,0) = -2 \\ f(D) &= f(5,2) = 4,4 \\ f(E) &= f(1,6) = 18,8 \\ f(F) &= f(0,5) = 16 \end{aligned}$$

Máximo = 18,8 en (1,6)

Mínimo = -2 en (5,0)

EJERCICIO 2.-



a) $a = 3 \Rightarrow b = -9 + 12 = 3$

Área = $ab = 9 \text{ u}^2$

b) $S = ab = a(12 - a^2)$

$S' = 12 - 3a^2 = 0$ $a = 2$

máximo

Vértices: $O(0,0)$ $A(2,0)$ $B(0,8)$ $C(2,8)$

c) Área máxima $S_{\max} = 2 \cdot 8 = 16 \text{ u}^2$

EJERCICIO 3.-

Moneda I : CX

Moneda II : CC

Moneda III : XX

$$a) P(C) = \frac{1}{2} \cdot \frac{1}{2} + \frac{3}{10} = \frac{11}{20} = 0,55$$

$$b) P(I|C) = \frac{P(C|I)P(I)}{P(C)} = \frac{\frac{1}{4}}{\frac{11}{20}} = \frac{5}{11} \approx 0,454$$

EJERCICIO 4

$$a) z_{\alpha/2} \frac{\sigma}{\sqrt{n}} = 1,645 \frac{0,5}{3} \approx 0,274$$

Intervalo de confianza:

$$I = \left(\bar{X} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}} ; \bar{X} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}} \right) =$$

$$= (10,3 - 0,274 ; 10,3 + 0,274) = (10,026 ; 10,574)$$

$$b) 2,33 \frac{0,5}{\sqrt{n}} \leq 0,2 \Rightarrow \sqrt{n} \geq 5,83$$

$$n \geq 33,98$$

$$n \geq 34$$

OPCIÓN B

EJERCICIO 1.-

$$a) \begin{vmatrix} 1 & -1 & k \\ 2 & -k & 1 \\ 1 & -1 & -1 \end{vmatrix} = k^2 - k - 2 = 0 \Rightarrow k = -1, 2$$

$k \neq -1, k \neq 2$ Sistema compatible determinado

$$k = -1 \Rightarrow \left. \begin{array}{l} x - y - z = 1 \\ 2x + y + z = 2 \\ x - y - z = -2 \end{array} \right\} \text{Sistema incompatible}$$

$$k = 2 \Rightarrow \left. \begin{array}{l} x - y + 2z = 1 \\ 2x - 2y + z = 2 \\ x - y - z = 1 \end{array} \right\} \begin{array}{l} \text{Sistema compatible} \\ \text{indeterminado.} \end{array}$$

b) $k = 2 \Rightarrow x = 1 + \lambda, y = \lambda, z = 0 \quad \lambda \in \mathbb{R}$

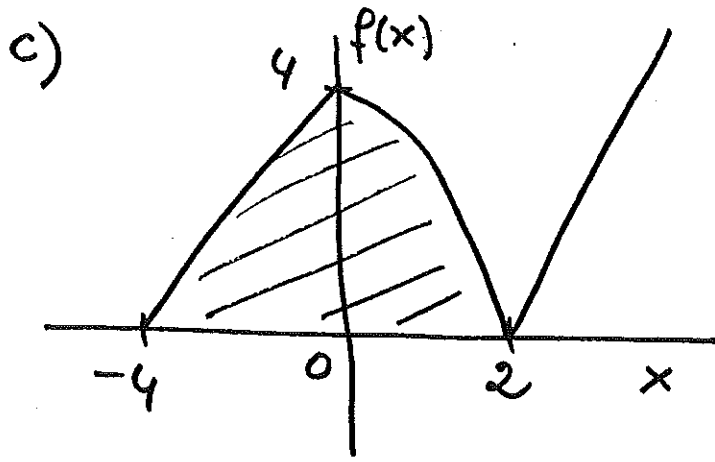
c) $k = 3 \Rightarrow x = 3, y = \frac{5}{4}, z = -\frac{1}{4}$

EJERCICIO 2.-

$$a) \left. \begin{array}{l} f(2^-) = f(2) = 0 \\ f(2^+) = 2a + b \end{array} \right\} 2a + b = 0$$

$$\left. \begin{array}{l} f'(2^-) = -4 \\ f'(2^+) = a \end{array} \right\} \boxed{a = -4} \quad \boxed{b = 8}$$

b) $\left. \begin{array}{l} f'(1) = -2 \\ f(1) = 3 \end{array} \right\} \text{Tangente } y = -2x + 5$



$$\begin{aligned} \text{Área} &= \frac{1}{2} \cdot 4 \cdot 4 + \int_0^2 (4 - x^2) dx \\ &= 8 + \left(4x - \frac{x^3}{3}\right) \Big|_0^2 = \frac{40}{3} \end{aligned}$$

EJERCICIO 3

- a) $P(A \cap B) = 0$
 $P(A)P(B) = 0,08 \neq 0$ } No son independientes
- b) $P(A \cap B) = P(A)P(B) = 0,08 \neq 0$
 No son excluyentes
- c) $P(A|B) = 0 \Rightarrow P(A \cap B) = 0$
 Son excluyentes; no son independientes porque $P(A)P(B) \neq 0$.
- d) $A \subset B \Rightarrow P(A \cap B) = P(A) = 0,2 \neq P(A)P(B)$
 No son independientes

EJERCICIO 4

a) $z_{\alpha/2} \frac{\sigma}{\sqrt{n}} = 1,96 \frac{10}{16} = 1,225 \approx 1,23$

Intervalo de confianza:

5

$$I = \left(\bar{X} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}} ; \bar{X} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}} \right) =$$

$$= (19 - 1,23 ; 19 + 1,23) = (17,77 ; 20,23)$$

$$b) z_{\alpha/2} \frac{\sigma}{\sqrt{n}} \leq 1,225 \quad ; \quad z_{\alpha/2} = 2,58$$

$$\sqrt{n} \geq 2,58 \frac{10}{1,23} \approx 20,98$$

$$n \geq 440,16$$

$$n \geq 441$$

