

UNIVERSIDAD MAYOR DE SAN SIMON
ECONOMIA DE EMPRESAS II

EXAMEN FINAL

NOMBRE:.....

1.-

$$q = (X_1 + 2)(X_2 - 2)$$

$$P_1 = 10$$

$$P_2 = 5$$

$$C = ?$$

DADOS LOS PRECIOS DE LOS INSUMOS, CUAL SERA LA COMBINACION OPTIMA DEL INSUMO X_1 Y DEL INSUMO X_2 QUE NOS PERMITAN MINIMIZAR EL COSTO PARA PRODUCIR 100 UNIDADES DEL PRODUCTO

EXAMEN FINAL

$$1.- \quad q = (x_1 + 2)(x_2 - 2)$$

$$P_1 = 10$$

$$P_2 = 5$$

$$C = ?$$

Para 100 unidades = q

$$100 = (x_1 + 2)(x_2 - 2)$$

$$100 - (x_1 + 2)(x_2 - 2) = 0$$

$$C = 10x_1 + 5x_2$$

$$Z = 10x_1 + 5x_2 + \lambda [100 - (x_1 + 2)(x_2 - 2)]$$

$$\frac{dz}{dx_1} = 10 - \lambda(x_2 - 2) \Rightarrow \lambda = \frac{10}{(x_2 - 2)}$$

$$\frac{dz}{dx_2} = 5 - \lambda(x_1 + 2) \Rightarrow \lambda = \frac{5}{(x_1 + 2)}$$

$$\frac{dz}{d\lambda} = 100 - (x_1 + 2)(x_2 - 2) = 0$$

$$\frac{10}{(x_2 - 2)} = \frac{5}{(x_1 + 2)}$$

$$10(x_1 + 2) = 5(x_2 - 2)$$

$$10x_1 + 20 = 5x_2 - 10$$

$$10x_1 + 20 + 10 = 5x_2$$

$$\frac{10x_1 + 30}{5} = x_2$$

$$2x_1 + 6 = x_2 //$$

$$x_2 = 2x_1 + 6$$

$$x_2 = 2(5,07) + 6$$

$$\boxed{x_2 = 16,14}$$

$$C = 10x_1 + 5x_2$$

$$C = 10(5,07) + 5(16,14)$$

$$\boxed{C = 131,4}$$

Reemplazando

$$100 - (x_1 + 2)[(2x_1 + 6) - 2] = 0$$

$$100 - (x_1 + 2)(2x_1 + 4) = 0$$

$$100 - (2x_1^2 + 4x_1 + 4x_1 + 8) = 0$$

$$100 - (2x_1^2 + 8x_1 + 8) = 0$$

$$100 - 2x_1^2 - 8x_1 - 8 = 0$$

$$-2x_1^2 - 8x_1 + 92 = 0 \quad (-1)$$

$$2x_1^2 + 8x_1 - 92 = 0$$

$$a \quad b \quad c$$

$$x_1 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x_1 = \frac{-(8) \pm \sqrt{(8)^2 - 4(2)(-92)}}{2 \cdot 2}$$

$$x_1 = \frac{-8 \pm \sqrt{64 + 736}}{4}$$

$$x_1 = \frac{-8 \pm \sqrt{800}}{4}$$

$$x_1 = \frac{-8 \pm 28,28}{4}$$

$$x_1 = \frac{-8 + 28,28}{4} = \boxed{5,07} \quad \checkmark$$

$$x_1 = \frac{-8 - 28,28}{4} = -9,07$$

Gráfica

