

$$U = 8x^{1/4}y^{3/4} - 20000 \quad x+y = 20,000$$

sustituya $y = 20,000 - x$ en $U(x)$.

$$U(x) = 8x^{1/4}(20,000-x)^{3/4} - 20 \text{ mil}$$

$$U'(x) = 2x^{-3/4}(20,000-x)^{3/4} - 6x^{1/4}(20,000-x)^{-1/4} = 0$$

$$\frac{2}{x^{3/4}}(20,000-x)^{3/4} = \frac{6x^{1/4}}{(20,000-x)^{1/4}}$$

$$(20,000-x) = 3x$$

$$20,000 = 4x \Rightarrow x = 5,000, \\ y = 15,000.$$

Método 3: Microeconomía.

$$P = x^\alpha y^\beta \quad x+y = 20 \text{ mil}$$

$$\alpha + \beta = 1.$$

Producción óptima

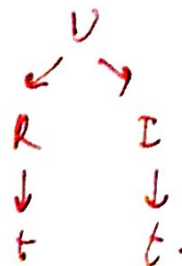
$$x = \alpha \cdot 20 \text{ mil} \quad \alpha = 1/4$$

$$y = \beta \cdot 20 \text{ mil} \quad \beta = 3/4$$

$$\frac{P_A}{P_B} = \frac{\alpha y}{\beta x} \quad | \text{ Relación.}$$

$$3d \quad V = RI. \quad R = f(t) \quad I = g(t).$$

$$\frac{dV}{dt} = \underbrace{\frac{\partial V}{\partial R}}_I \frac{dR}{dt} + \underbrace{\frac{\partial V}{\partial I}}_{R.} \left(\frac{dI}{dt} \right)$$



$$R = 400, \quad I = 0.08 \quad \frac{dV}{dt} = -0.01 \quad \frac{dR}{dt} = -0.03$$

$$-0.01 = 0.08(-0.03) + 400 \frac{dI}{dt}$$

$$400 \frac{dI}{dt} = -0.01 + 0.0024 = -7.6 \times 10^{-3}$$

$$\frac{dI}{dt} = \frac{-7.6 \times 10^{-3}}{4 \times 10^2} = -1.9 \times 10^{-5} \quad 4/s.$$

$$-19 \mu A/s$$

$$3c) \quad T(x, y) \quad x = \sqrt{1+t}, \quad y = 2 + \frac{t}{3}$$

$$T_x(2, 3) = 4, \quad T_y(2, 3) = 3, \quad t = 3$$

$$\frac{dT}{dt} = \underbrace{\frac{\partial T}{\partial x}}_4 \frac{dx}{dt} + \underbrace{\frac{\partial T}{\partial y}}_3 \frac{dy}{dt}$$

$$x(3) = 2$$

$$y(3) = 2 + 1 = 3$$

$$x'(t) = \frac{1}{2}(1+t)^{-1/2} \quad x'(3) = \frac{1}{2} \frac{1}{\sqrt{4}} = \frac{1}{4}$$

$$y'(t) = \frac{1}{3} \quad y'(3) = \frac{1}{3}$$

$$\frac{dT}{dt} = 4\left(\frac{1}{4}\right) + 3\left(\frac{1}{3}\right) = 1 + 1 = 2.$$