

$$12: f(x,y) = x^2 - 2xy + 2y \quad 0 \leq x \leq 3 \quad 0 \leq y \leq 2$$

$$f_x = 2x - 2y = 0 \quad f_y = 2 - 2x = 0 \quad 2x = 2 \quad x = 1 \quad 2(1) - 2y = 0$$

$$2y = 2 \quad y = 1$$

$$\text{Punto crítico} = f(1,1) = (1) - 2(1)(1) + 2(1) = 1 - 2 + 2 = 1$$

$$f(1,1) = 1$$

$$0 \leq y \leq 2$$

$$0 \leq x \leq 3$$

$$f(0,y) = 2y$$

$$f(3,y) = 9 - 6y + 2y = 9 - 4y$$

$$f(x,0) = x^2 \quad f(x,2) = x^2 - 4x + 2$$

$$\max = f(0,2) = 4$$

$$\min = f(0,0) = 0$$

$$\max = f(3,0) = 9$$

$$\min = f(3,2) = 1$$

$$\max = f(3,0) = 9 \quad \max = f(0,2) = 4$$

$$\min = f(0,0) = 0 \quad \min = f(2,2) = 0$$

$$\max = f(3,0) = 9$$

$$\min = f(0,0) = f(2,2) = 0$$

$$13: f(x,y) = x^2 + 2y^2 \quad g(x,y) = x^2 + y^2 = 1$$

$$\nabla f = \begin{bmatrix} 2x \\ 4y \end{bmatrix}$$

$$\nabla g = \begin{bmatrix} 2x \\ 2y \end{bmatrix}$$

$$\nabla f = \lambda \nabla g$$

$$2x = \lambda 2x$$

$$4y = \lambda 2y$$

$$x^2 + y^2 = 1$$

$$1) \quad \lambda = 1 \quad \therefore y = 0 \quad x^2 = 1 \quad \therefore x = \pm 1$$

$$1.1) f(1,0) = 1$$

$$1.2) f(-1,0) = 1$$

2)

$$\lambda = 0 \quad \therefore \lambda = 1/2 \quad y^2 = 1 \quad \therefore y = \pm 1$$

$$2.1) f(0,1) = 2$$

$$2.2) f(0,-1) = 2$$

Maximos

Minimos

$$f(0,1) = 2$$

$$f(1,0) = 1$$

$$f(0,-1) = 2$$

$$f(-1,0) = 1$$