

$$Z = x^2 + 3y^2 + x - y$$

Restricciones:

$$(1) \quad x = 1$$

$$(2) \quad y = 1$$

$$(3) \quad x + y = 1$$

$$1.1 \text{ Dom } Z = \mathbb{R}^2$$

2 Puntos críticos

$$\frac{\partial f}{\partial x} = 2x + 1 = 0$$

$$Pc = \left(-\frac{1}{2}, \frac{1}{6}\right)$$

$$\frac{\partial f}{\partial y} = 6y - 1 = 0$$

$$3. \quad - g_1(x, y) = x - 1$$

$$- g_2(x, y) = y - 1$$

$$- g_3(x, y) = x + y - 1$$

$$L(x, y, \lambda, \lambda_2, \lambda_3) = f(x, y) + \lambda g_1(x, y) + \lambda_2 g_2(x, y) + \lambda_3 g_3(x, y)$$

$$L(x, y, \lambda, \lambda_2, \lambda_3) = x^2 + 3y^2 + x - y + \lambda(x - 1) + \lambda_2(y - 1) + \lambda_3(x + y - 1)$$

4 Puntos Criticos

$$\frac{\partial L}{\partial x} = 2x + 1 + \lambda + \lambda_3 = 0$$

$$\frac{\partial L}{\partial y} = 6y - 1 + \lambda_2 + \lambda_3 = 0$$

$$\frac{\partial L}{\partial \lambda} = x - 1 = 0$$

$$\frac{\partial L}{\partial \lambda_2} = y - 1 = 0$$

$$\frac{\partial L}{\partial \lambda_3} = x + y - 1 = 0$$

- No hay Puntos Criticos

- Dentro del triangulo no se
encontraron puntos criticos,
pero :

$$H = \begin{bmatrix} \frac{\partial^2 f}{\partial x^2} & \frac{\partial^2 f}{\partial y \partial x} \\ \frac{\partial^2 f}{\partial x \partial y} & \frac{\partial^2 f}{\partial y^2} \end{bmatrix}$$

$$H = \begin{bmatrix} 2 & 0 \\ 0 & 6 \end{bmatrix} \text{ En el punto } \left(-\frac{1}{2}, \frac{1}{6}\right)$$

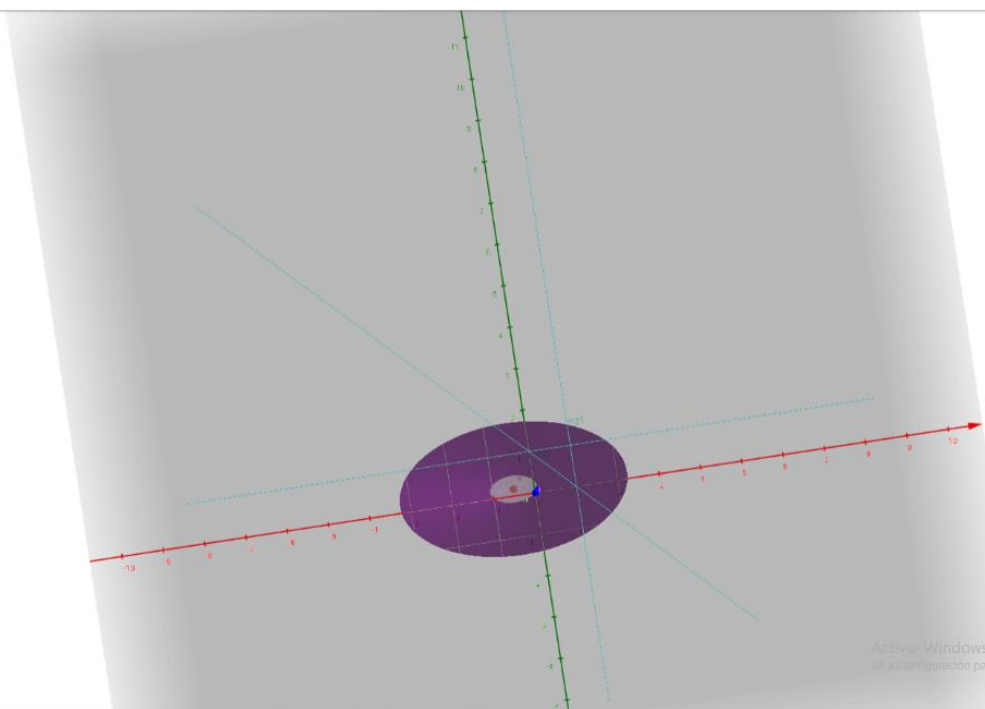
$$\Delta_1 = 12 > 0 \quad \wedge \quad \Delta_2 = 12 > 0$$

Mínimo local

Rpta: En $\left(-\frac{1}{2}, \frac{1}{6}\right)$ se encuentra
un mínimo local o valor mínimo

GeoGebra Calculadora 3D

$a(x, y) = x^3 + 3y^3 + x - y$
 $A = \left(-\frac{1}{2}, \frac{1}{6}\right) \Rightarrow \left(-\frac{1}{2}, \frac{1}{6}\right)$
 $\rightarrow (-0.5, 0.17, -0.33)$
 eq1: $x = 1$
 f: $y = 1$
 eq2: $x + y = 1$
 + Entrada...



Activar Windows
Ir a Configuración para activar W