

1) $f(x,y) = 12x^2 - 4x^3 + 6y^2 + 12xy$

$$f_x = 24 - 12x^2 + 12$$

$$f_y = 12y + 12x$$

$$\in (0,0), (1,-1)$$

↑
critical point

$$f(0,0) = 0 \in \text{min}, \quad f_{yy} = 12$$

$$D = 0 \cdot 12 - 12^2 = -144 < 0 \quad DLO$$

$(1,-1)$ is a saddle point