

$$\textcircled{7} f(x,y) = x^2 + y^2 - 2x \quad (2,0) \quad (0,2) \quad (0,-2)$$

$$f_x = 2x - 2 \quad f_y = 2y$$

$$f_{xx} = 2 \quad f_{xy} = f_{yx} = 0 \quad f_{yy} = 2$$

$$D = f_{xx} f_{yy} = 4$$

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

$$x = 1$$

$$y = 0$$

$$f(x,0) = x^2 - 2x \quad f'(x,0) = 2x - 2 \quad 0 = 2x - 2 \quad x = 1 \quad (1,0)$$

$$f(0,y) = y^2 \quad f'(0,y) = 2y \quad 0 = 2y \quad y = 0 \quad (0,0)$$

$$\text{Points: } (2,0), (0,2), (0,-2), (1,0), (0,0)$$

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

$$f(0,2) = 0 + 4 - 0 = 4 \quad f(1,0) = 1 + 0 - 2 = -1$$

$$\text{Absolute maximum} = f(0,2) = f(0,-2) = 4$$

$$\text{Absolute minimum} = f(1,0) = -1$$