

9.7.18

$$f = x^2 - 6x - y^2$$

$$P = [-1, 5]$$

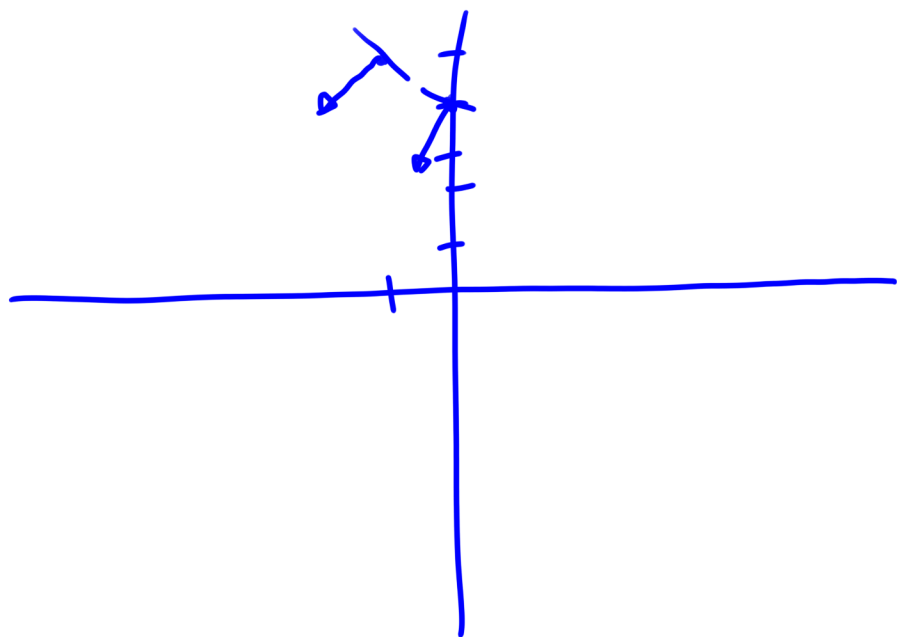
$$V = \nabla f$$

$$\partial_x f = 2x - 6$$

$$\partial_y f = -2y$$

$$V = \begin{bmatrix} 2x - 6 \\ -2y \end{bmatrix}$$

$$V(P) = \begin{bmatrix} 2(-1) - 6 \\ -2(5) \end{bmatrix} = \begin{bmatrix} -2 - 6 \\ -10 \end{bmatrix} = \begin{bmatrix} -8 \\ -10 \end{bmatrix}$$



$$V \left( \begin{bmatrix} 0 \\ 4 \end{bmatrix} \right) = \begin{bmatrix} -6 \\ -8 \end{bmatrix}$$