

$$w = \begin{bmatrix} w_0 \\ \vdots \\ w_m \end{bmatrix}$$

$$\phi(x_i) = (1, x_i, \dots, x_i^m)$$

$$\phi(x) = \begin{pmatrix} 1 & x_1 & \dots & x_i \\ \vdots & x_2 & & \\ \vdots & \vdots & & \\ \vdots & x_n & & \end{pmatrix}$$

$$\hat{y} = w^T \phi(x)$$

$$w^T = [w_0 \dots w_m]$$

$$\phi(x_i) =$$

$$x + 1 = 2 \Rightarrow x = 1$$

① equation  $\rightarrow$  ① unknown.

$$\begin{cases} x + y = 2 \\ x + 2y = 4 \end{cases} \Rightarrow \begin{cases} x = \\ y = \end{cases}$$

$$y = \underbrace{a}_{w_1} x + \underbrace{b}_{w_0} \quad \begin{cases} A(1, 1) \\ B(2, 3) \end{cases} \Rightarrow \begin{cases} a = ? \\ b = ? \end{cases}$$

$$\Rightarrow y = \underline{x + 2}$$

$M$   
equation

$\Rightarrow M$  unknown

$M$  point.

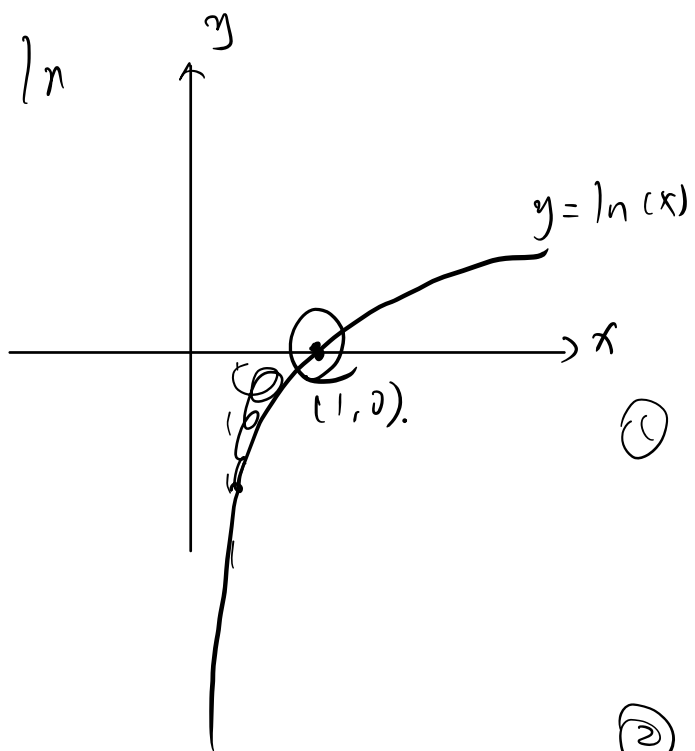
$A(1,1)$

$B(2,3)$

$\vdots$

$M(100, 200)$

$\rightarrow$



$$\textcircled{1} \ln(x) \rightarrow -\infty$$

$$x \rightarrow 0_+$$

$$\textcircled{2} \ln(x) = -18.$$

$$x = 0.3, 0.5$$

$$\textcircled{3} \ln(x) = 0.$$

$$x \rightarrow 1$$

$$x = 0.9, 0.99.$$

$$W_{\text{new}} = W - \alpha \cdot \nabla J(w)$$

$$\nabla J(w)$$

$$\alpha = 0.1, 0.01 > 0$$

$$A: \nabla J(w) > 0$$

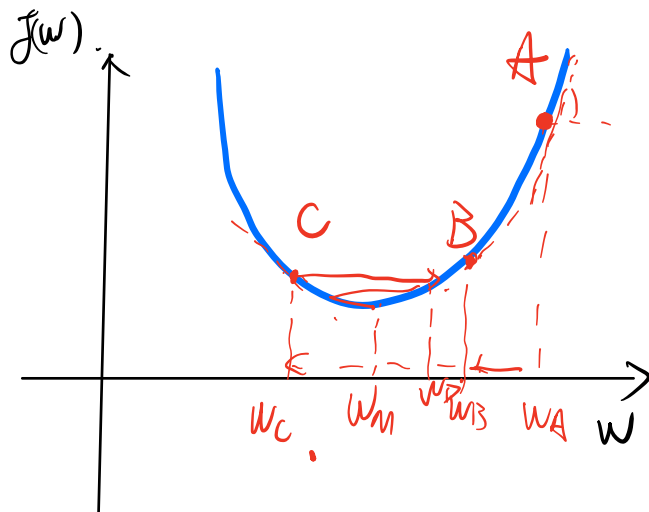
$$\alpha \cdot \nabla J(w) > 0$$

$$W_{\text{new}} = W_A - \underbrace{\alpha \cdot \nabla J(w)}_{> 0}$$

$$C: \nabla J(w) < 0$$

$$\alpha \cdot \nabla J(w) < 0$$

$$W_{\text{new}} = W_C - \underbrace{\alpha \cdot \nabla J(w)}_{< 0}$$



$$B:$$