



# COST FUNCTION



Halotech Academy



# Training Linear Regression

**Linear  
Regression**  
**W** dan **b**

## **Cost Function**

Merupakan Fungsi yang digunakan untuk menghitung tingkat error pada suatu algoritma machine learning linear

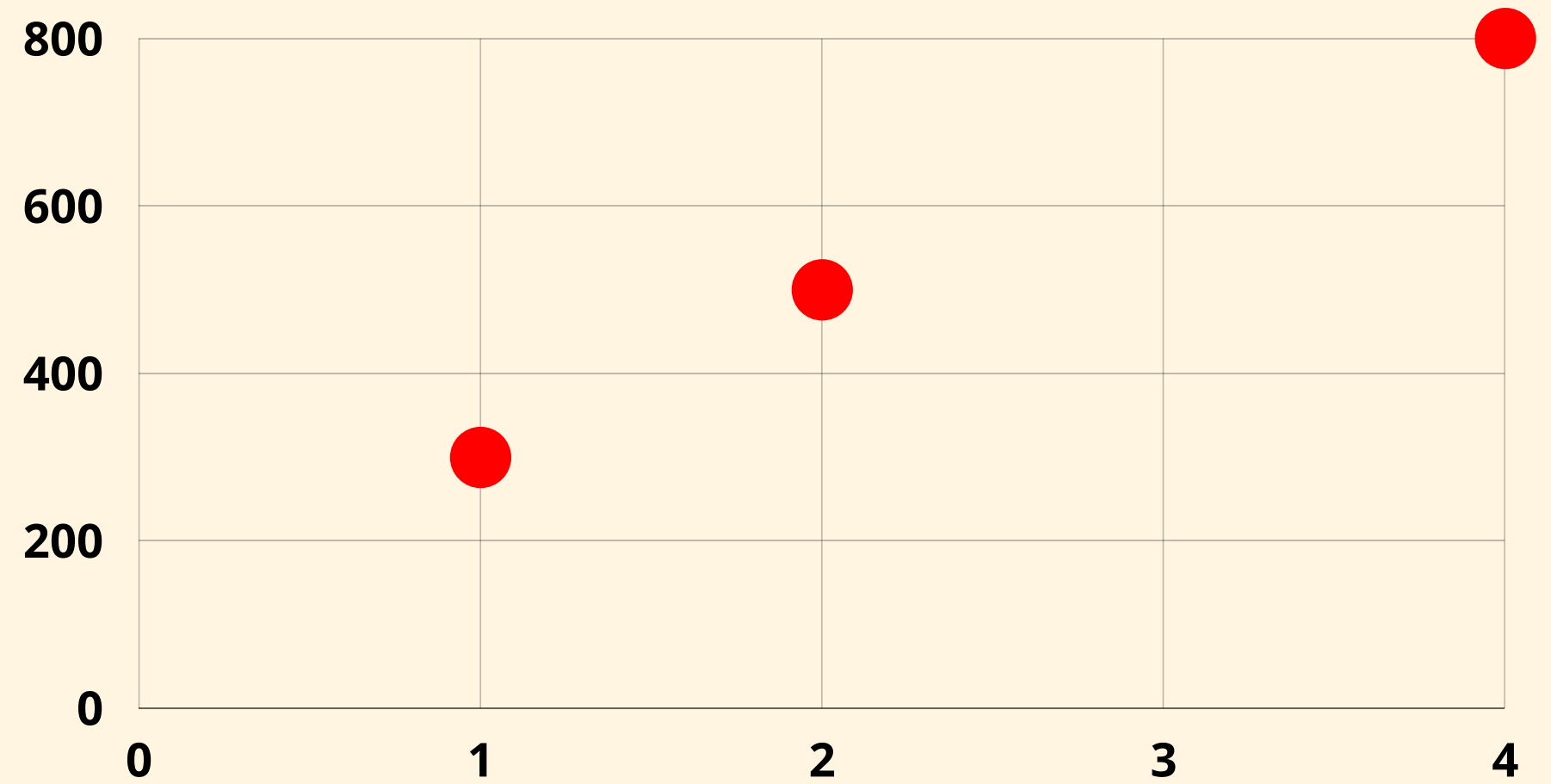
## **Gradient Descent**

Merupakan algoritma yang digunakan untuk memperkecil nilai **Cost Function**

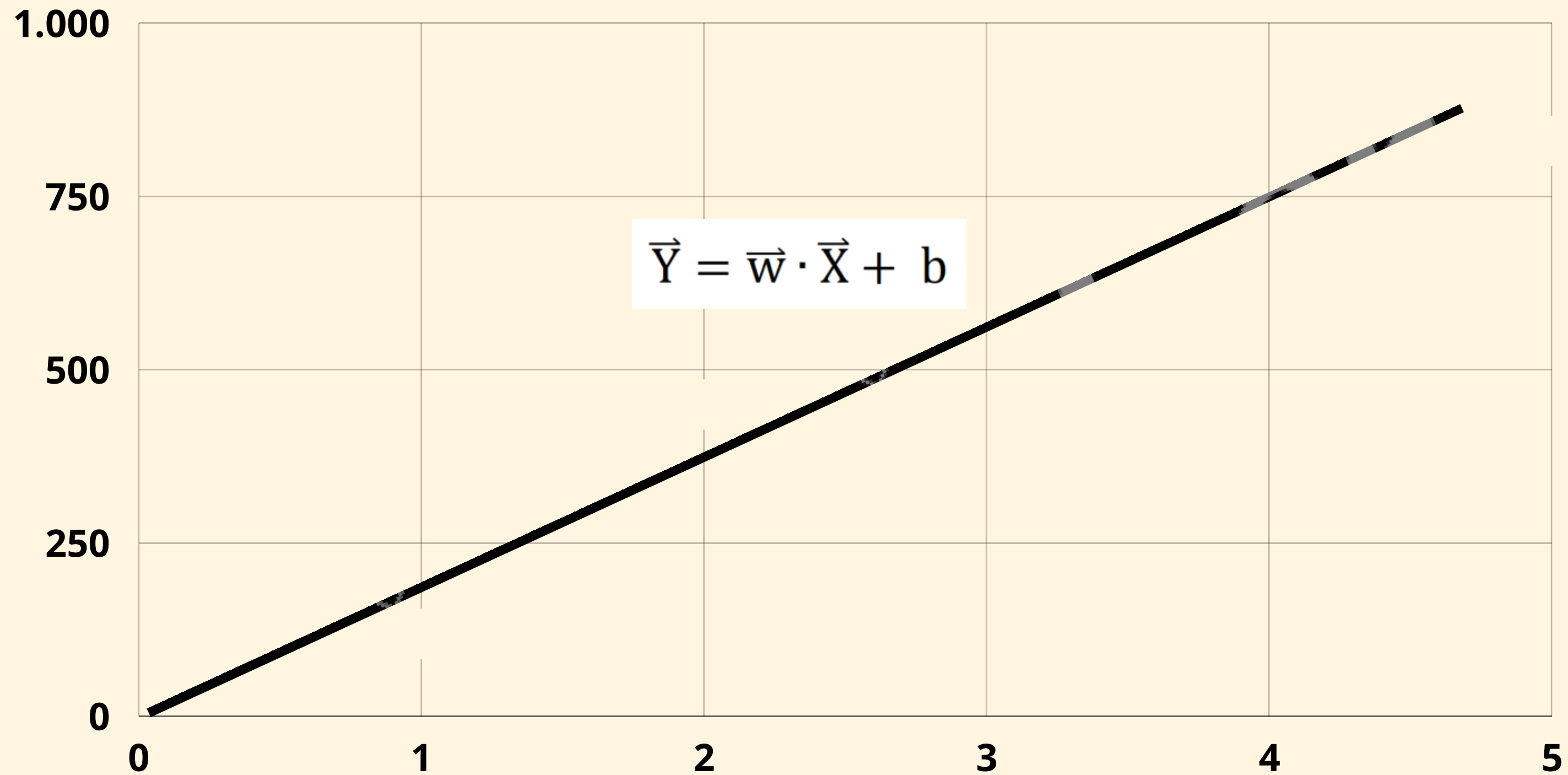
# **COST FUNCTION**

Merupakan Fungsi yang digunakan untuk menghitung tingkat error pada suatu algoritma machine learning linear

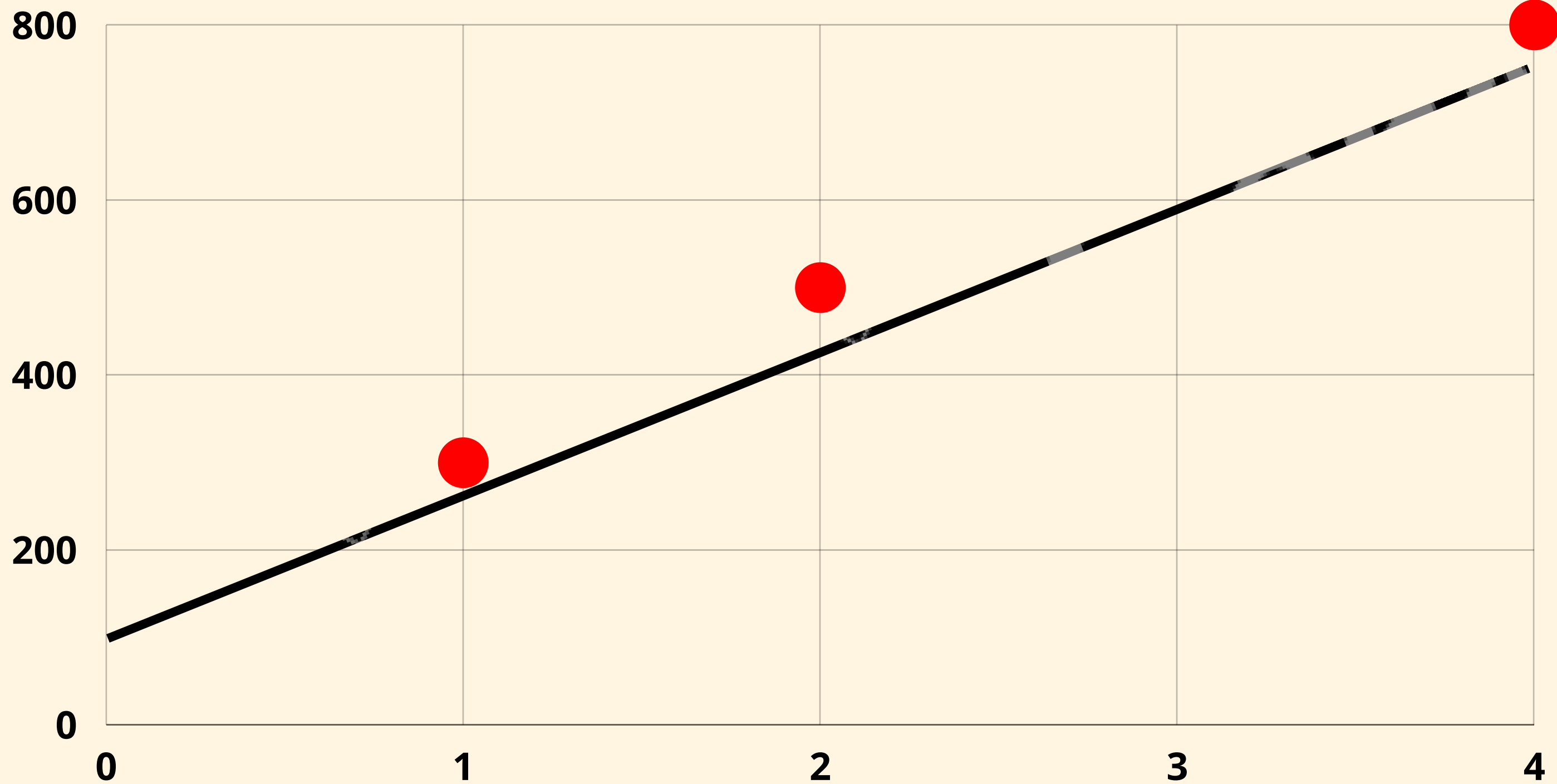
NO	Luas Rumah (1000 m2)	Harga (Jt)
1	1	300
2	2	500
3	4	800



# Persamaan Linear

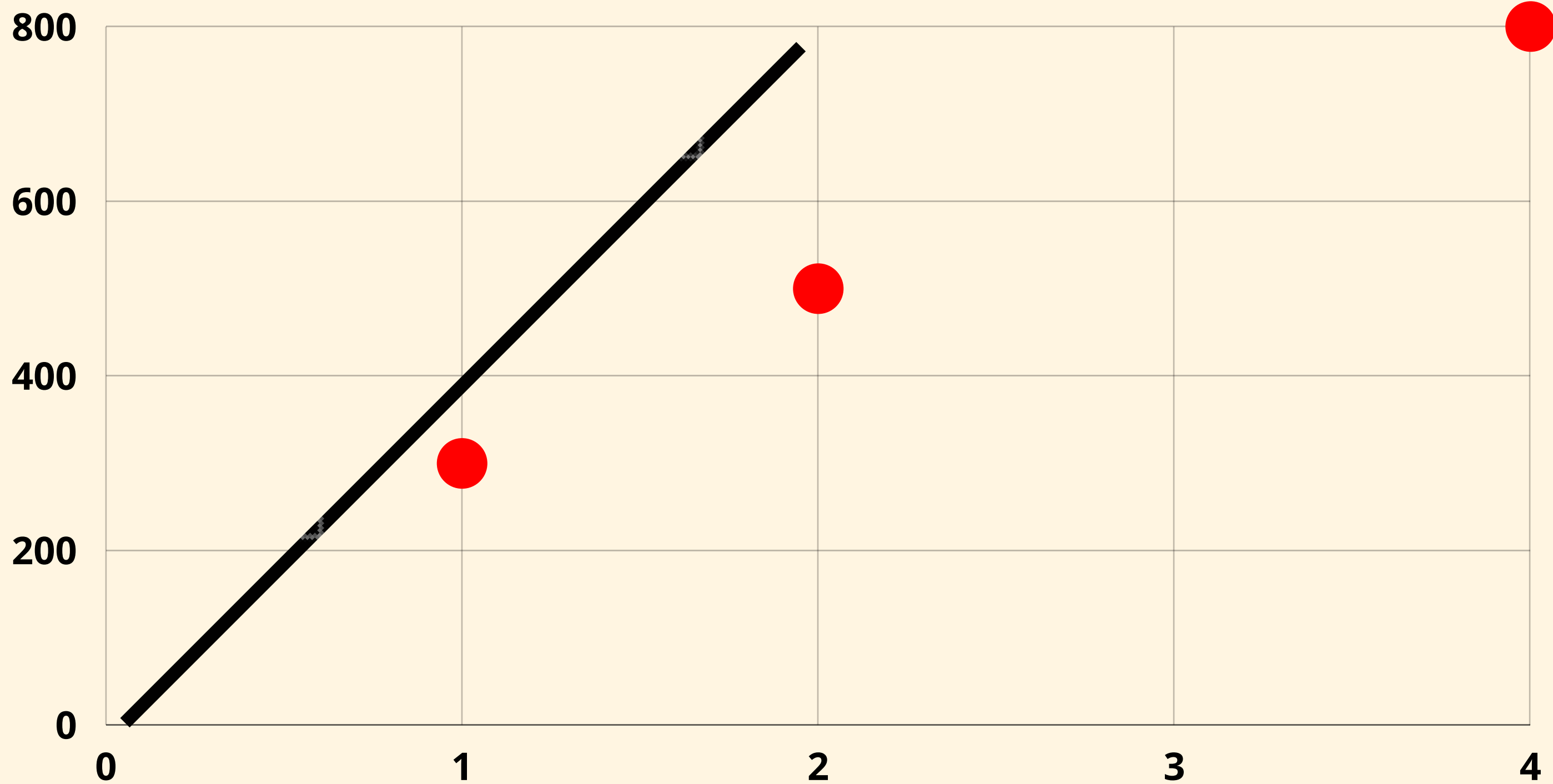


# Persamaan Linear



$$\vec{Y} = \vec{w} \cdot \vec{X} + b$$

# Persamaan Linear



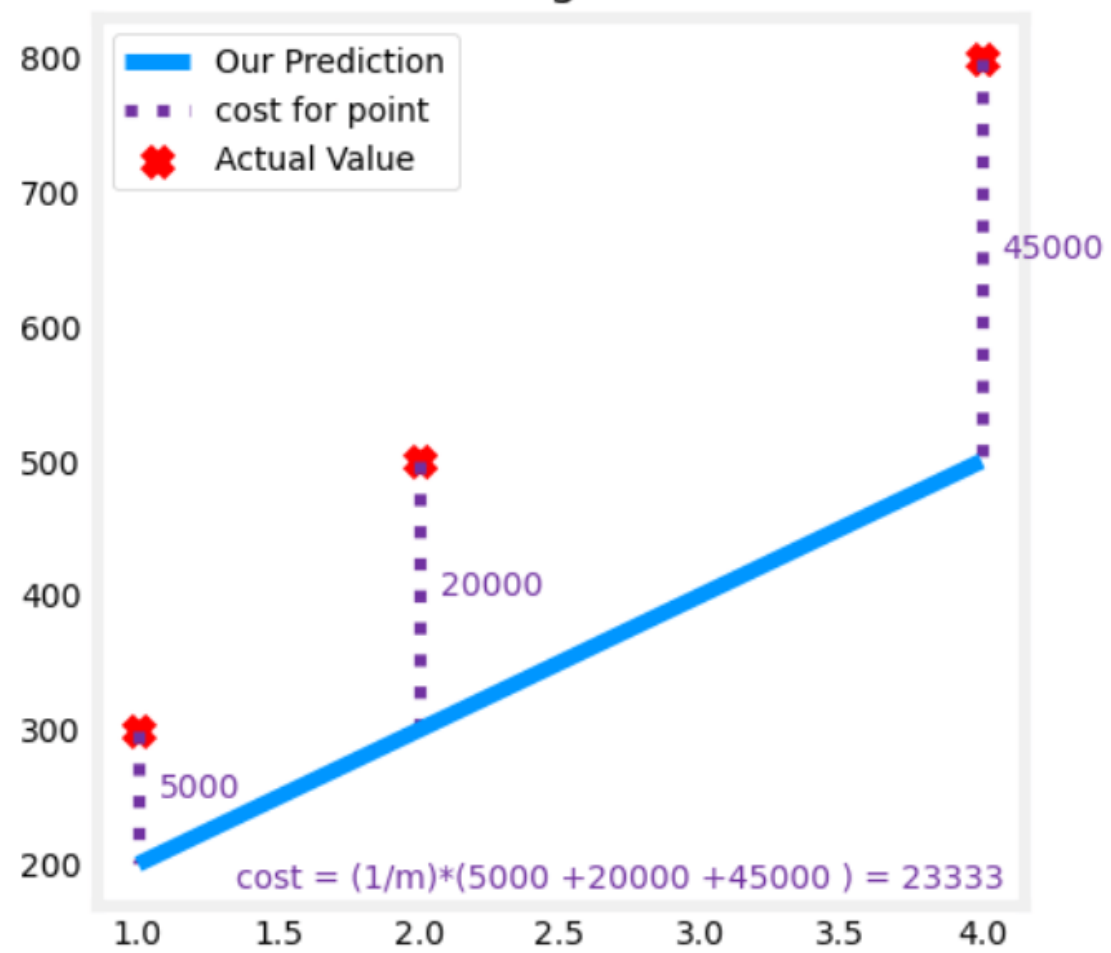
$$\vec{Y} = \vec{w} \cdot \vec{X} + b$$

Sekarang Kita akan coba beberapa persamaan linear

- $y = 100x + 100$
- $y = 200x + 100$
- $y = 300x + 100$
- $y = 190x + 100$

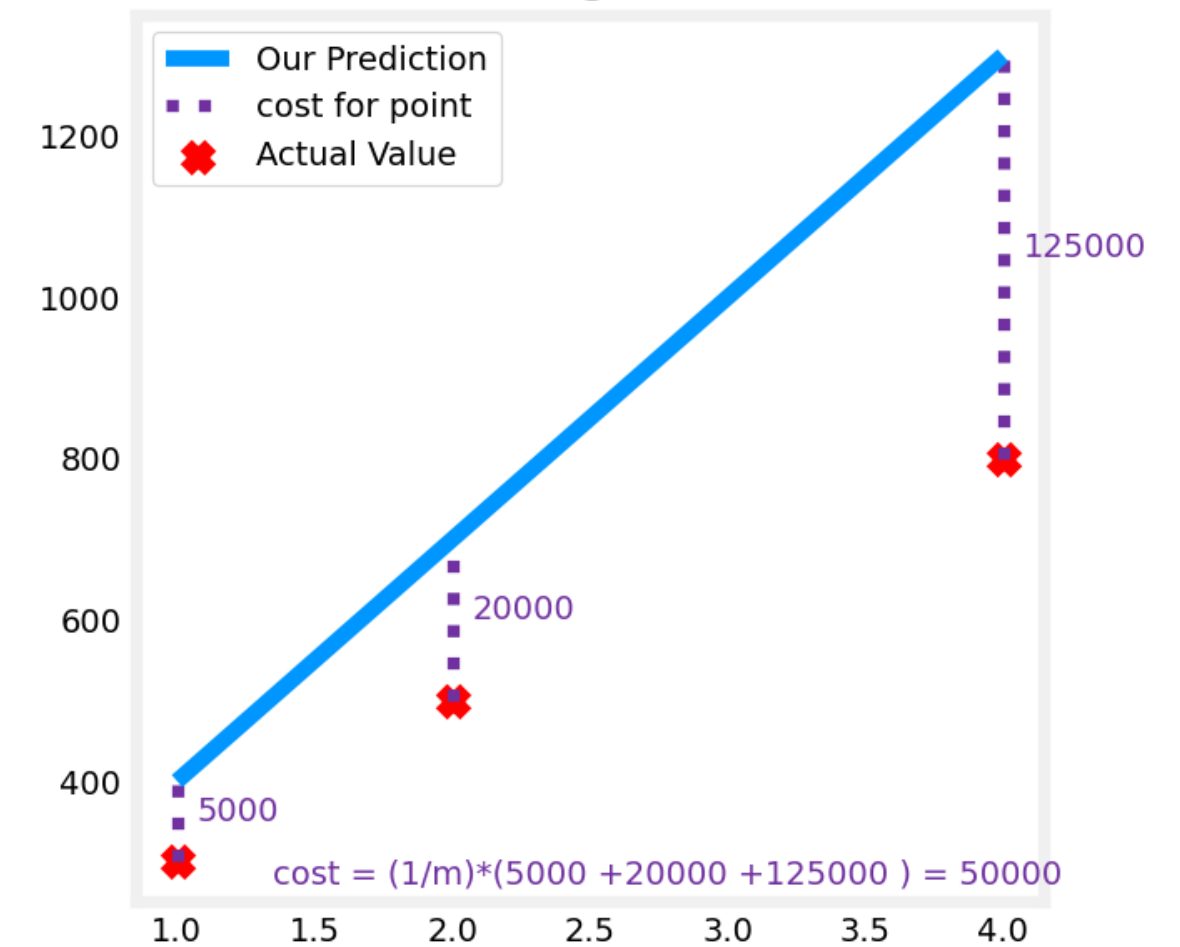
Dari persamaan di atas kita akan mencari nilai yang memiliki **cost function terkecil**.





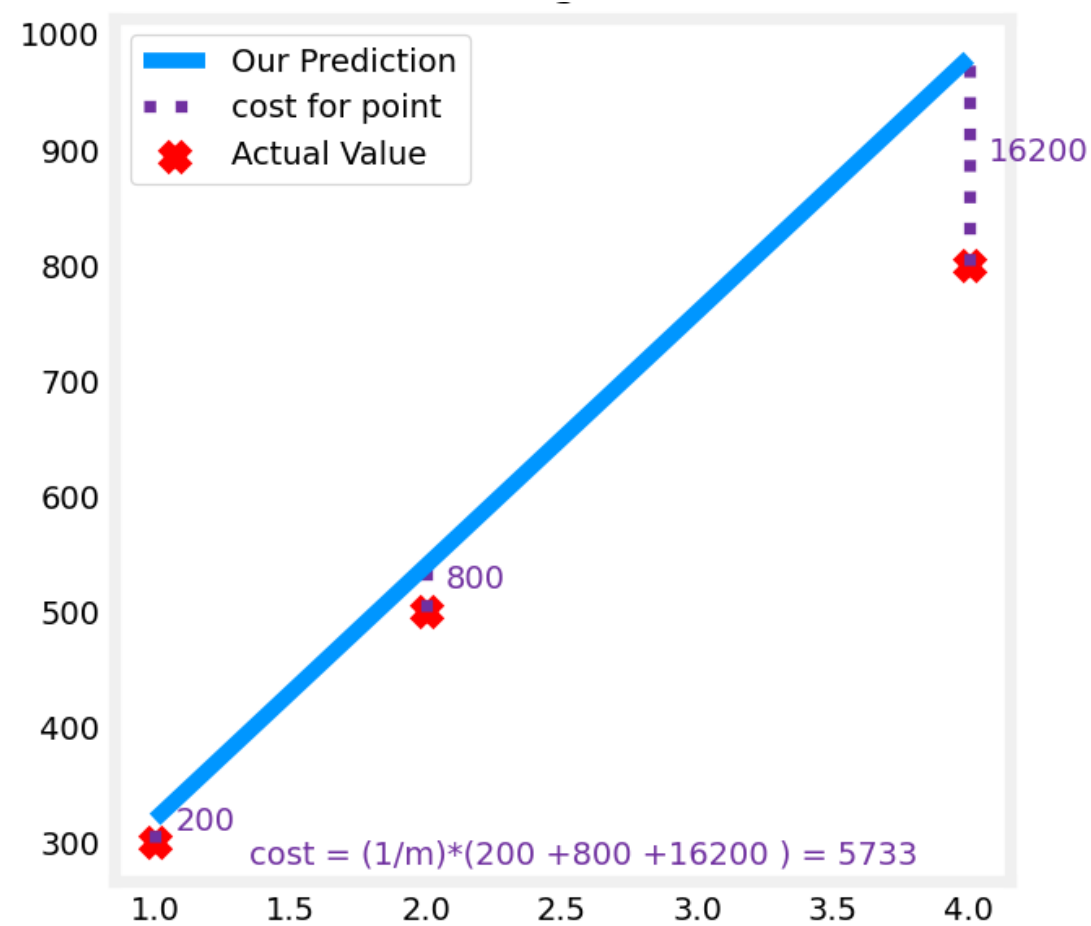
$$y = 100x + 100$$

$$\text{Cost} = 23.333$$



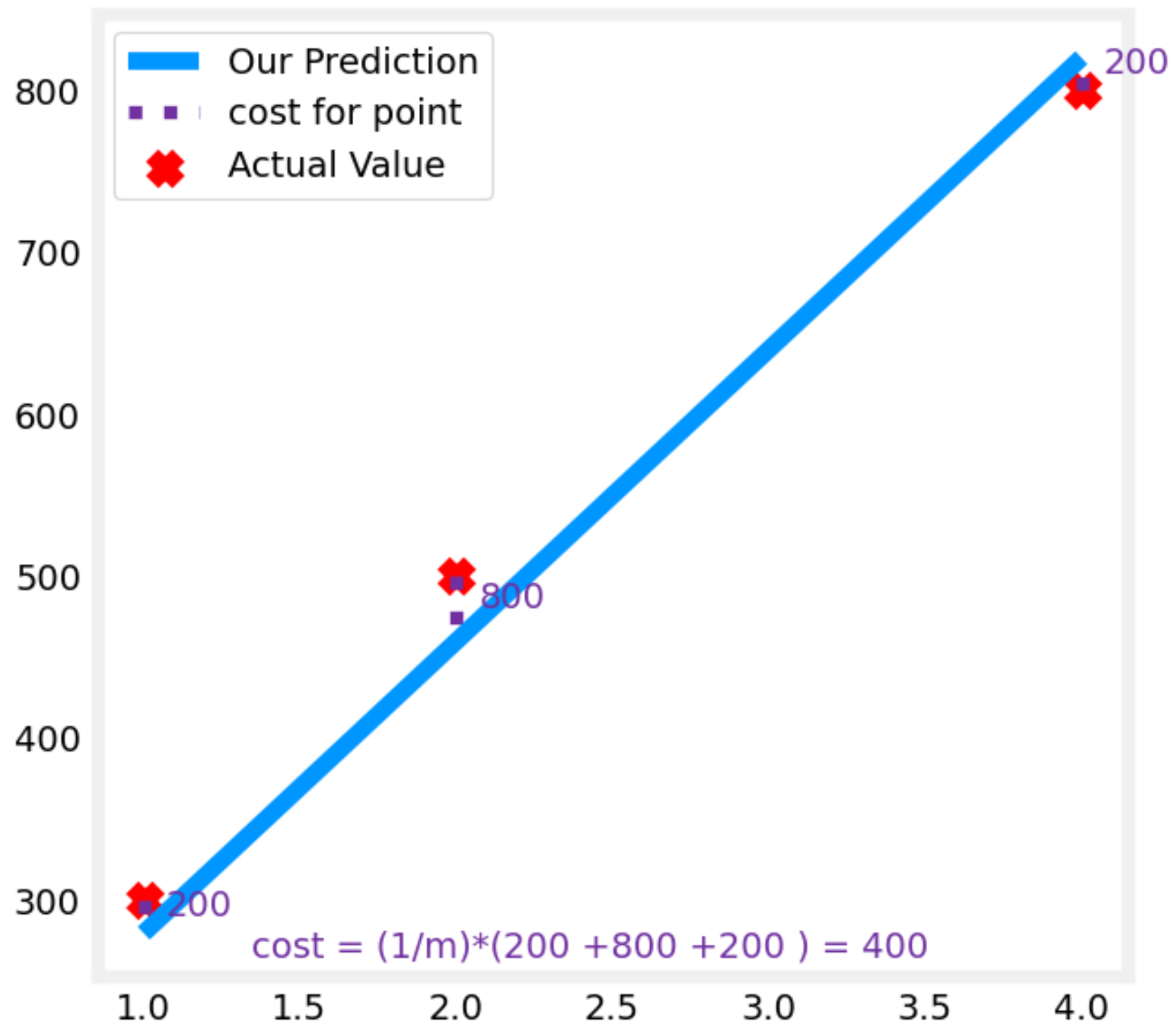
$$y = 300x + 100$$

$$\text{Cost} = 50.000$$



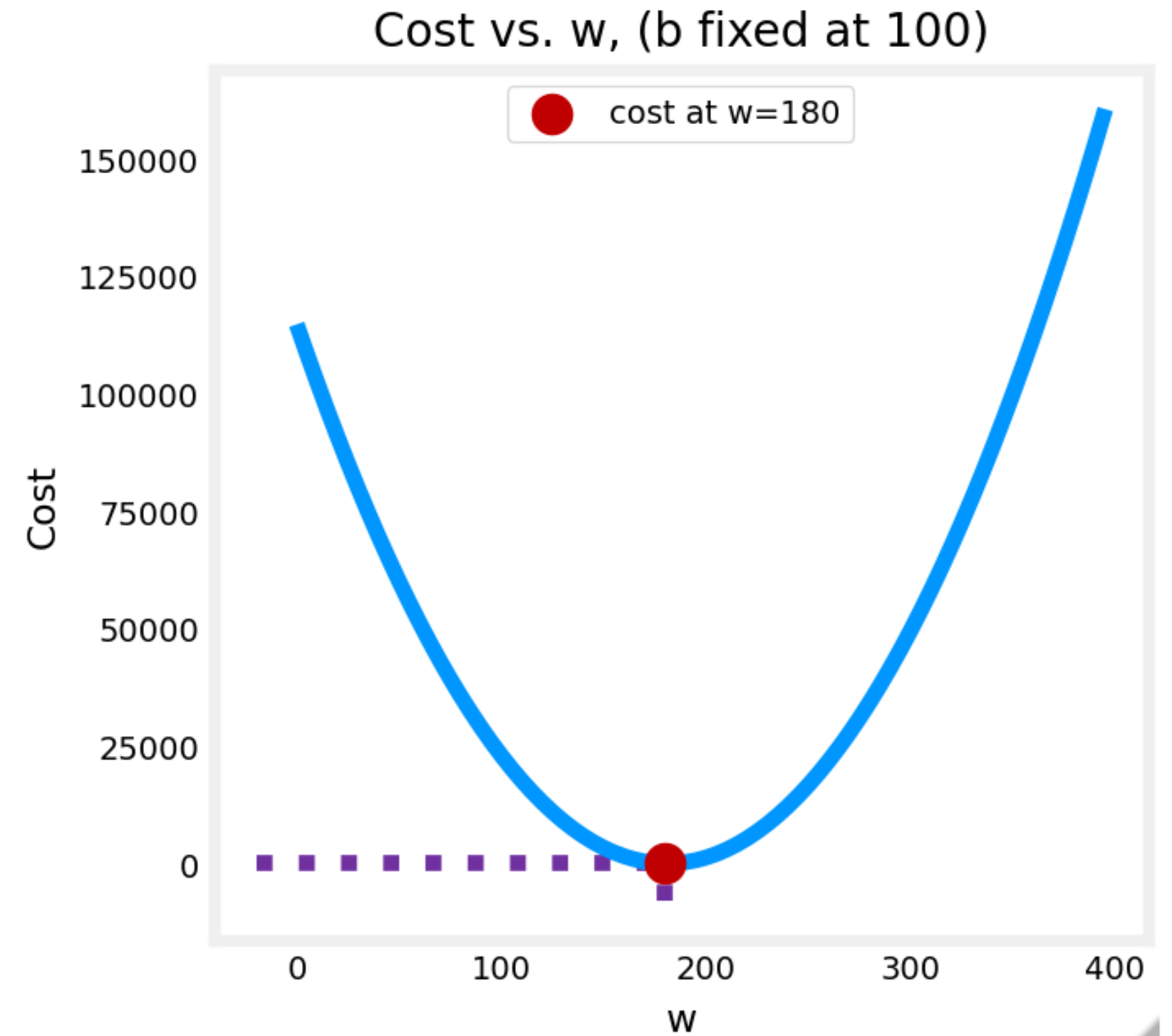
$$y = 200x + 100$$

$$\text{Cost} = 5.733$$



$$y = 180x + 100$$

$$\text{Cost} = 400$$



# Cost Function

$$J(w, b) = \frac{1}{2m} \sum_{i=0}^{m-1} (f_{w,b}(x^{(i)}) - y^{(i)})^2$$

$$f_{w,b}(x^{(i)}) = wx^{(i)} + b$$

$f_{w,b}(x^{(i)})$  = Persamaan Linear /  
Fungsi Prediksi

$x^{(i)}$  = X\_train , ke- i

$w$  = weight

$b$  = bias

$m$  = Jumlah Data

$y^{(i)}$  = Aktual Data, ke - i

$$J(w, b) = \frac{1}{2m} \sum_{i=0}^{m-1} (f(x^{(i)}) - y^{(i)})^2$$

$$J(w, b) = \frac{1}{2m} \sum_{i=0}^{m-1} ((wx^{(i)} + b) - y^{(i)})^2$$

$$J(180, 100) = \frac{1}{2m} \sum_{i=0}^{m-1} ((180x^{(i)} + 100) - y^{(i)})^2$$

$$J(180, 100) = \frac{1}{2(3)} [((180(1) + 100) - 300)^2 + ((180(2) + 100) - 500)^2 + ((180(4) + 100) - 800)^2]$$

$$J(180, 100) = \frac{1}{2(3)} [(280 - 300)^2 + (460 - 500)^2 + (820 - 800)^2]$$

$$J(180, 100) = \frac{1}{2(3)} [400 + 1600 + 300]$$

$$J(180, 100) = \frac{1}{6} [2400]$$

$$J(180, 100) = 400$$



# THANKS FOR WATCHING

Next Video : Gradient Descent



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