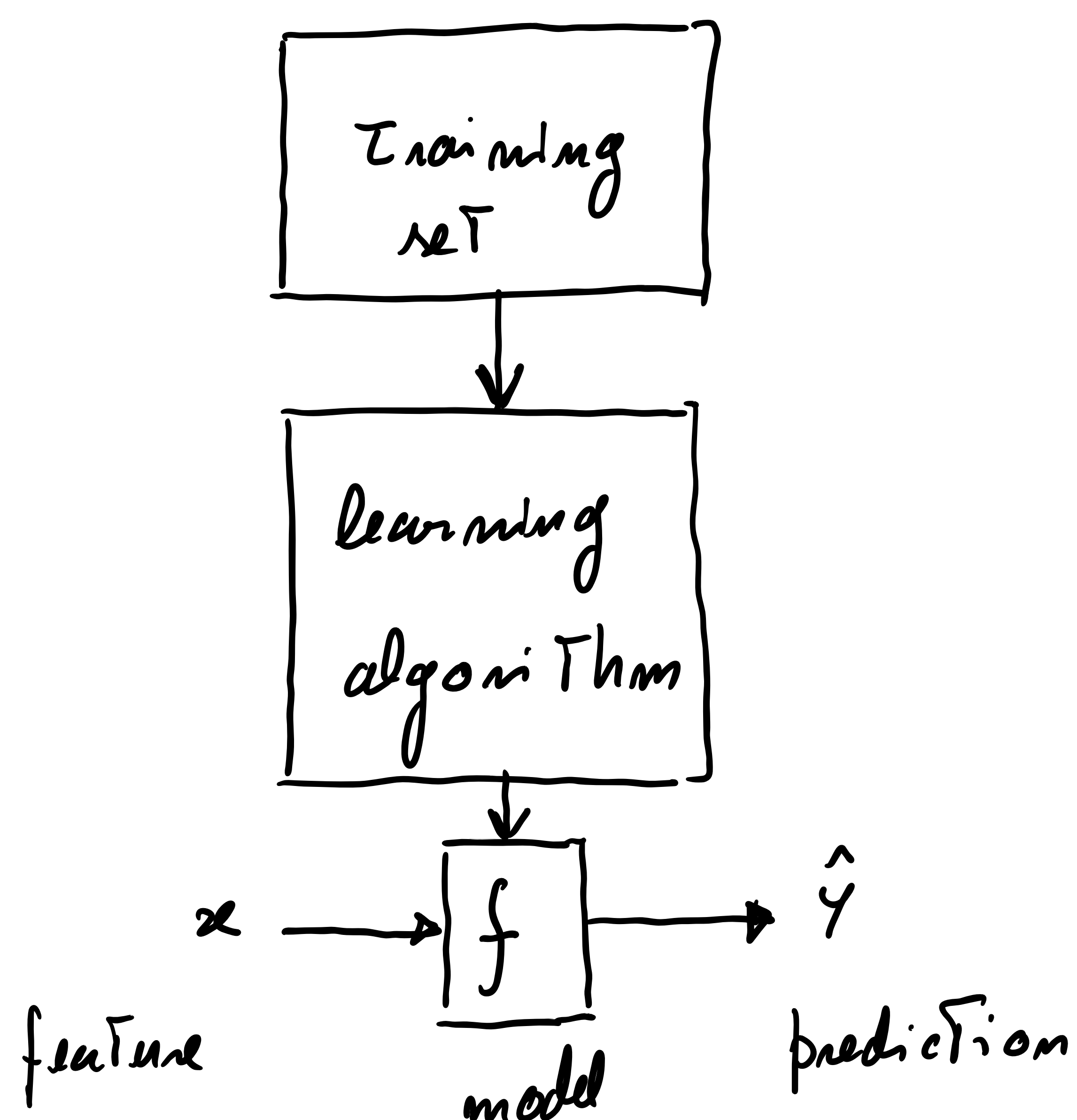
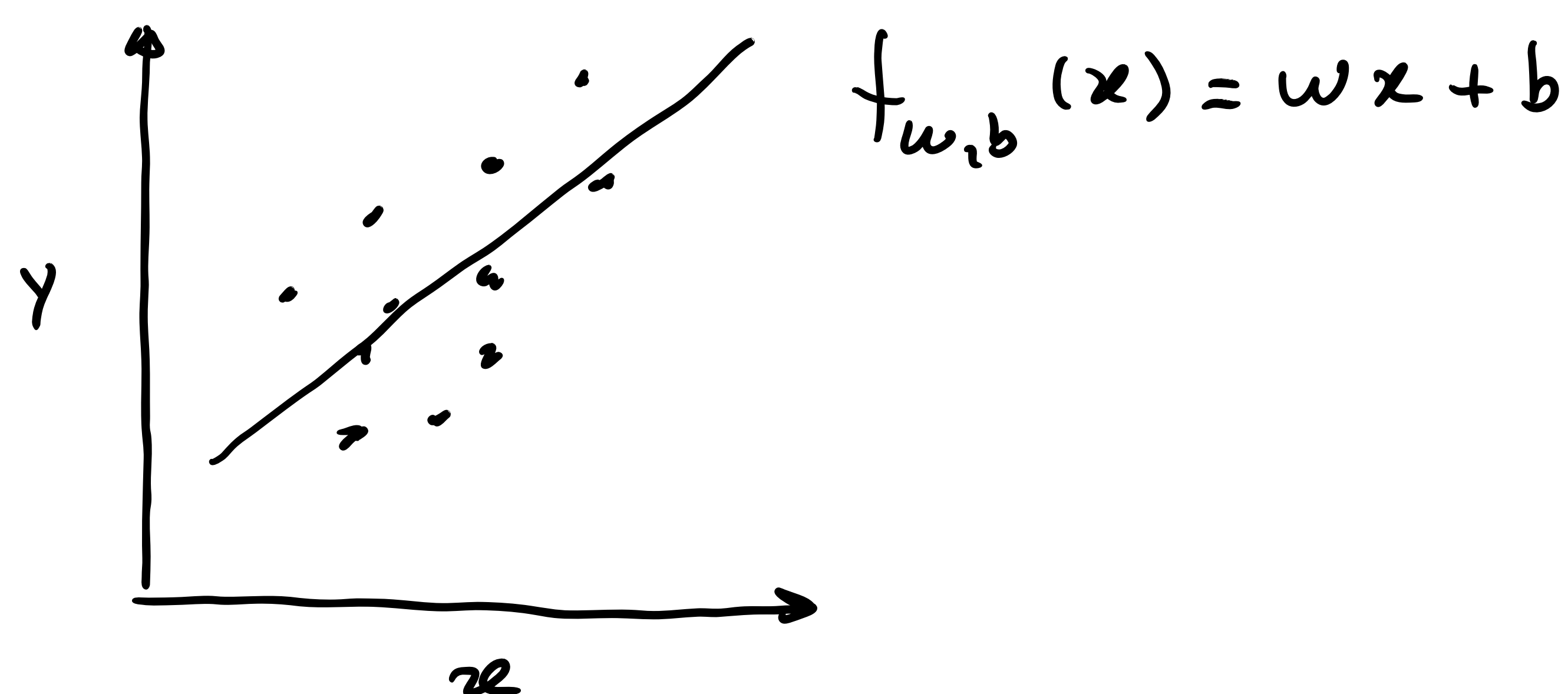


→ Linear Regression



• How to represent f ?

$$f_{w,b}(x) = wx + b \rightarrow \text{linear regression}$$



- Cost Function

$$\left. \begin{aligned} y^{(i)} &= f_{w,b}(x^{(i)}) \\ f_{w,b}(x^{(i)}) &= wx^{(i)} + b \end{aligned} \right\} \text{Find } w, b : \hat{y}^{(i)} \text{ is close to } y^{(i)} \text{ for all } (x^{(i)}, y^{(i)})$$

• Squared Error Cost Function

m = number of training examples

$$J(w, b) = \frac{1}{2m} \sum_{i=1}^m [\hat{y}^{(i)} - y^{(i)}]^2 \rightarrow \text{Cost Function: squared error cost function}$$

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

• model $\rightarrow f_{w,b}(x) = wx + b$

• parameters $\rightarrow w, b$

• cost function $\rightarrow J(w, b) = \frac{1}{2m} \sum_{i=1}^m [f_{w,b}(x^{(i)}) - y^{(i)}]^2$

• goal $\rightarrow \underset{w, b}{\text{minimize}} J(w, b)$