

- 1  $z = w_1 \cdot x_1 + w_2 \cdot x_2 + b$
- 2  $\hat{y} = f(z)$

## Mathematical Function

1.  $f(x) = 2x$

$$f(2) = \boxed{4}$$

2.  $f(x) = 3x + 2$

$$f(2) = 6 + 2 = \boxed{8}$$

3.

$$f(x, y) = 2x + 3y + 1$$

$$f(3, 4) = 2(3) + 3(4) + 1$$

$$= 6 + 12 + 1$$

$$= \boxed{19}$$

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$$f(3, 4) = -2(3) + 3(4) + 1$$

$$= -6 + 12 + 1$$

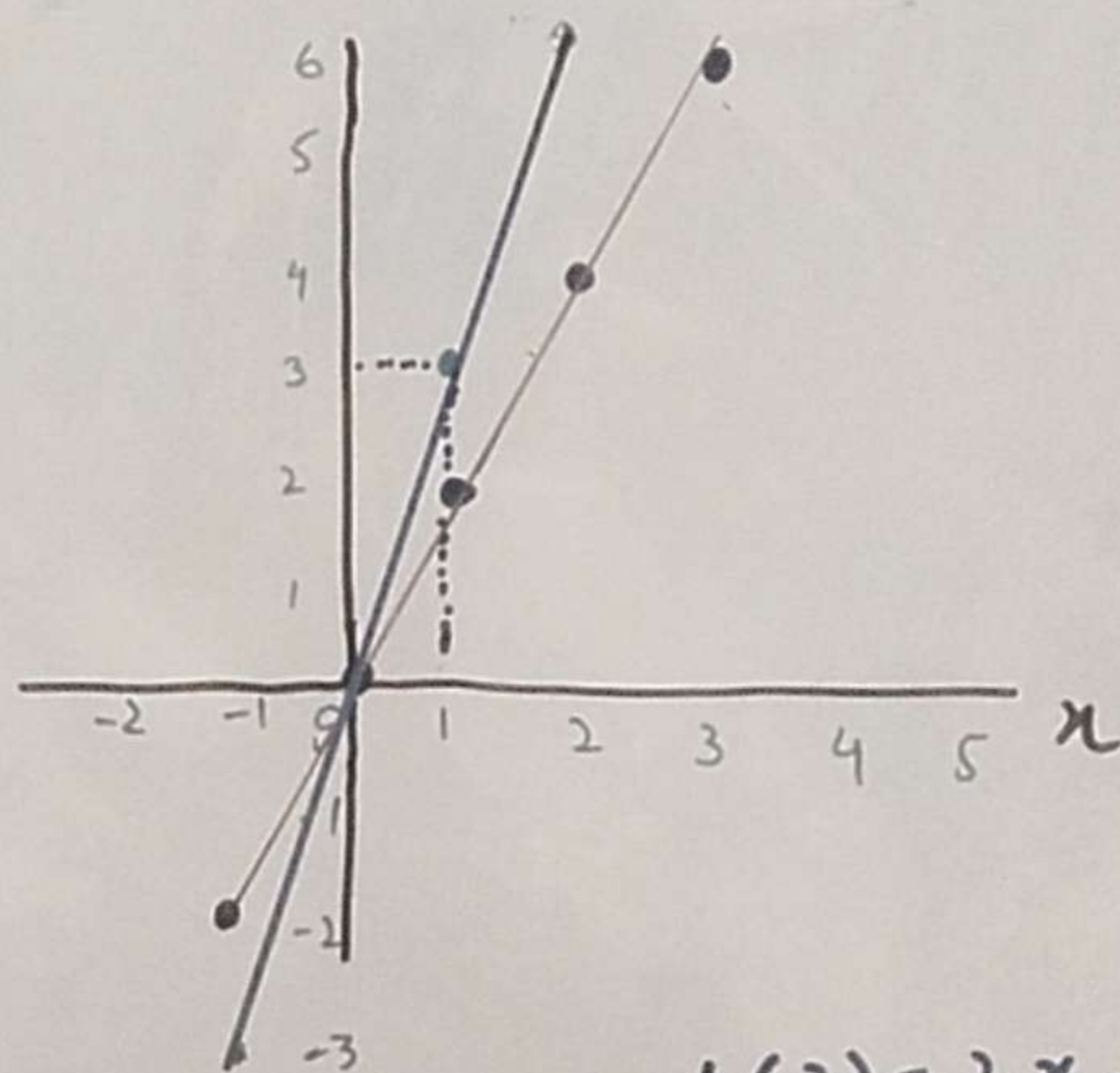
$$= \boxed{7}$$

$$f(3, 4) = 2(3) + 0(4) + 1$$

$$= 6 + 1 = \boxed{7}$$

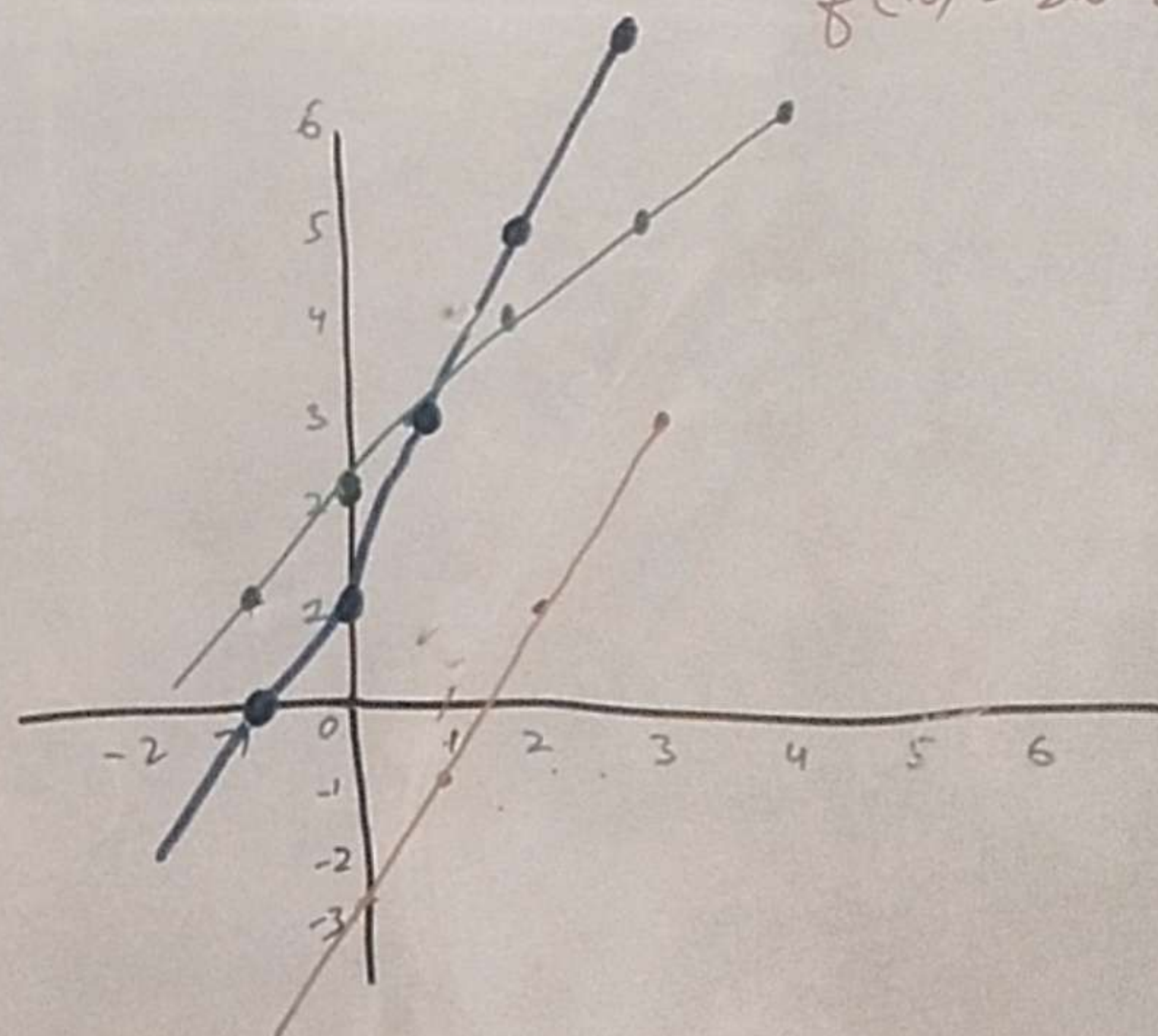
$$f(3, 4) = 1(3) + 1(4) + 0$$

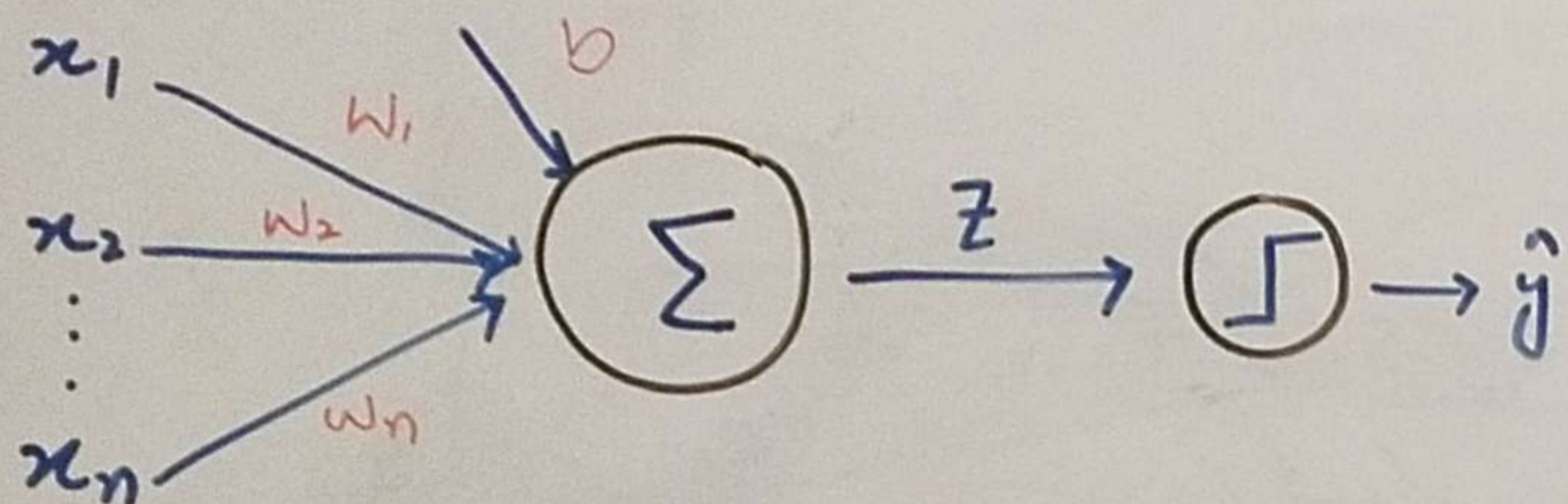
$$= 3 + 4 = 7$$



$$f(x) = 3x$$

$$f(2) = 2x + 1 \quad \left| \quad \begin{array}{l} f(x) = x + 2 \\ f(x) = 2x - 3 \end{array} \right.$$





	1	2	3	...	n
1	$x_{11}$	$x_{12}$	$x_{13}$		$x_{1n}$
2	$x_{21}$	$x_{22}$	$x_{23}$		$x_{2n}$
3	$x_{31}$	$x_{32}$	$x_{33}$		$x_{3n}$
4	$x_{41}$	$x_{42}$	$x_{43}$		$x_{4n}$
...					
m	$x_{m1}$	$x_{m2}$	$x_{m3}$		$x_{mn}$

$$z = w_1 x_1 + w_2 x_2 + w_3 x_3 + w_4 x_4 + b$$

$$X = \begin{bmatrix} 7 & 6 & 6 & 7 \\ 8 & 7 & 8 & 6 \\ \vdots & \vdots & \vdots & \vdots \\ 7 & 6.5 & 8 & 8 \end{bmatrix} \cdot \begin{bmatrix} w_1 \\ w_2 \\ w_3 \\ w_4 \end{bmatrix} \Rightarrow \begin{bmatrix} z_1 \\ z_2 \\ \vdots \\ z_m \end{bmatrix}$$

$m \times 4$        $4 \times 1$        $m \times 1$

$$\begin{matrix} m \times 4 \\ \boxed{4 \times 1} \\ m \times 1 \end{matrix}$$

	L	R	w	s
1	7	6	6	7
2	8	7	8	6
3	:	i	i	:
...				
100	7	6.5	8	8

$$z = X \cdot w + b$$

$$\hat{y} = f(z)$$