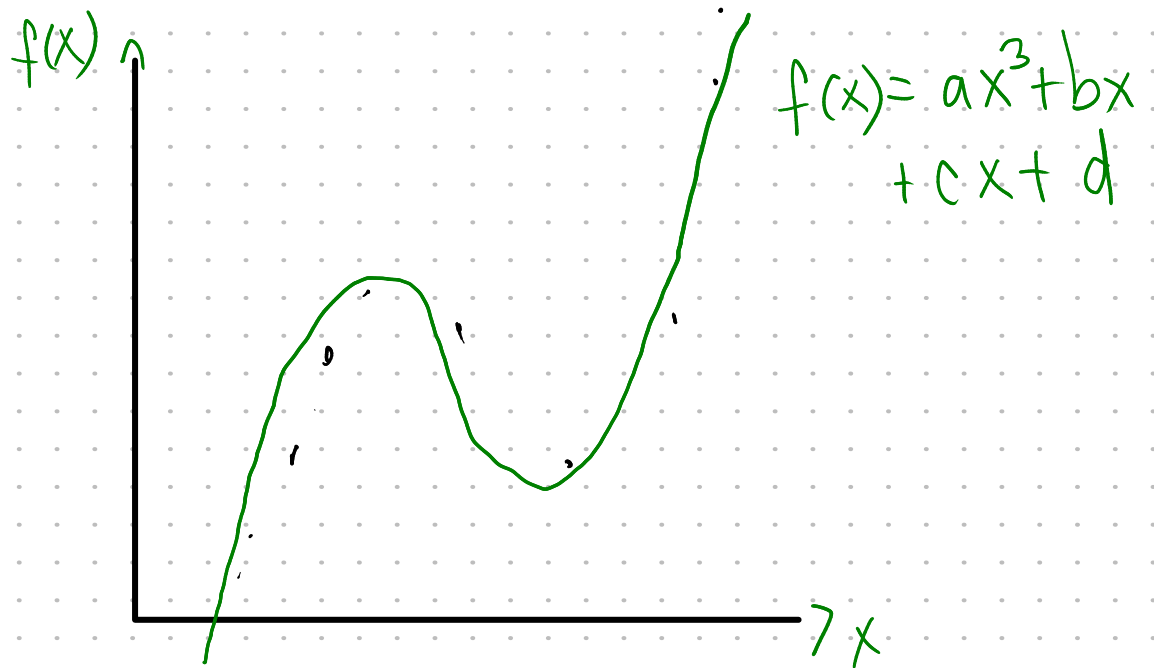
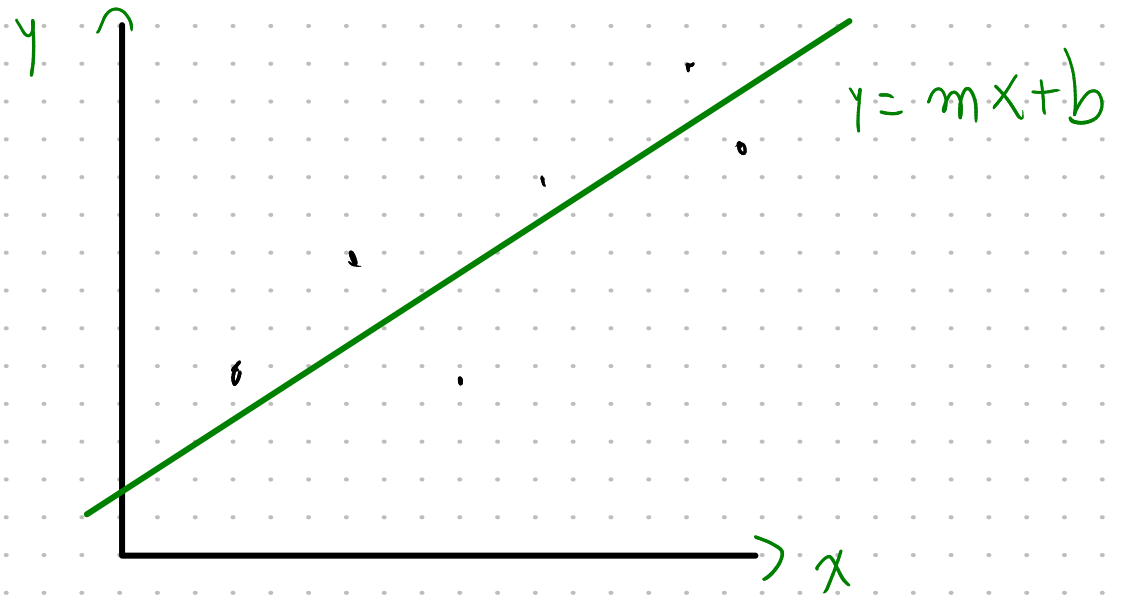
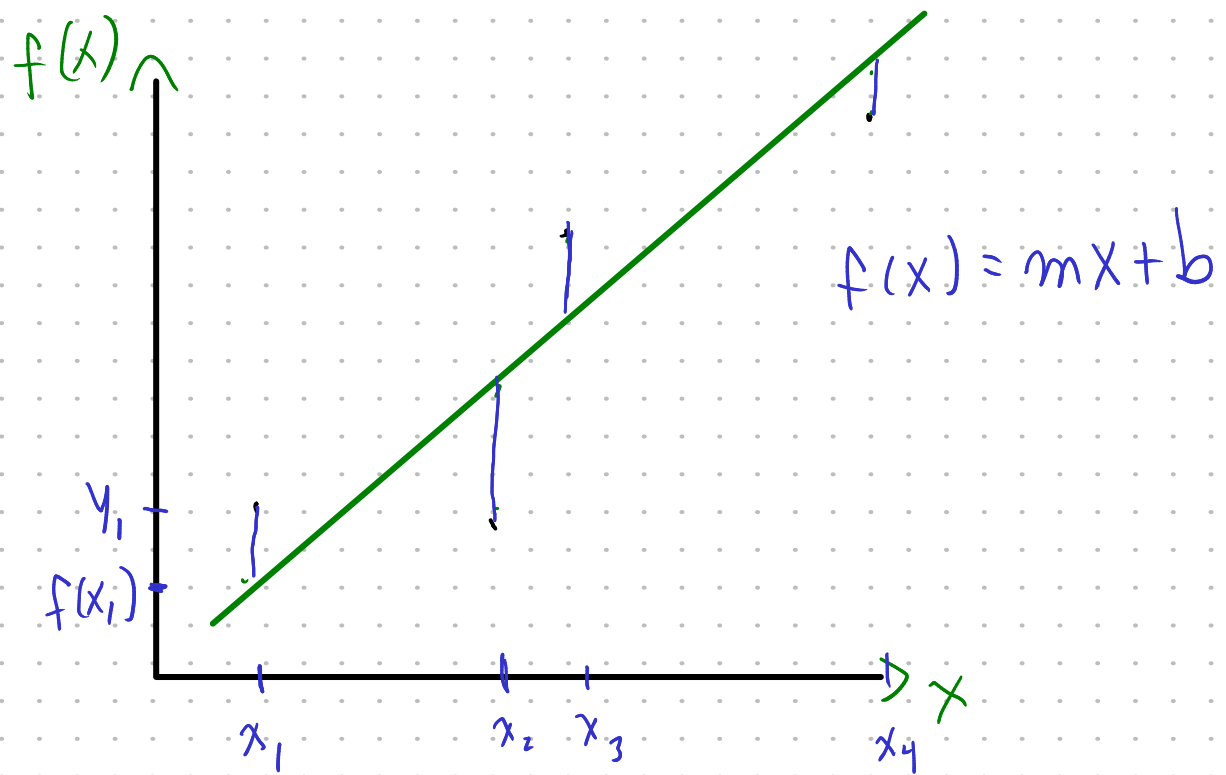


Método de Mínimos Cuadrados.





$$d_i = |y_i - f(x_i)|$$

$$S = \sum_i |y_i - f(x_i)|$$

$$S = \sum_i (y_i - f(x_i))^2 \leftarrow \text{Error quadratico medio.}$$

$$f(x_i) = m x_i + b_i$$

$$S = \sum_i (y_i - (m x_i + b_i))^2$$

$$\frac{\partial S}{\partial b} = 0 \quad \text{e} \quad \frac{\partial S}{\partial m} = 0$$

$$\begin{aligned} \frac{\partial S}{\partial b} &= \frac{\partial}{\partial b} \left(\sum (y_i - m x_i - b)^2 \right) \\ &= \left(\sum \frac{\partial}{\partial b} (y_i - m x_i - b)^2 \right) = 0 \end{aligned}$$

$$= \sum \frac{2}{2} (y_i - mx_i - b)(-1) = \frac{0}{2}$$

$$\sum y_i - \sum mx_i - b \sum 1 = 0$$

$$\sum_{i=1}^N 1 = N \leftarrow \text{Número de Datos}$$

$$\boxed{\frac{\sum y_i - m \sum x_i}{N} = b}$$

$$\frac{\partial S}{\partial m} = \frac{\partial}{\partial m} \sum (y_i - mx_i - b)^2$$

$$= \sum \frac{\partial}{\partial m} (y_i - mx_i - b)^2$$

$$= 2 \sum (y_i - mx_i - b)(-x_i) = 0$$

$$- \sum y_i x_i + \sum m x_i^2 + \sum b x_i = 0$$

$$b = \frac{\sum y_i - m \sum x_i}{N}$$

$$- \sum x_i y_i + \sum m x_i^2 + \sum \left(\frac{\sum y_i - m \sum x_i}{N} \right) x_i = 0$$

$$- \sum x_i y_i + m \sum x_i^2 + \frac{\sum x_i \sum y_i}{N} - \frac{m (\sum x_i)^2}{N} = 0$$

$$-N \sum x_i y_i + N m \sum x_i^2 + \sum x_i \sum y_i - m (\sum x_i)^2 = 0$$

$$m [N \sum x_i^2 - (\sum x_i)^2] = N \sum x_i y_i - \sum x_i \sum y_i$$

$$m = \frac{N \sum x_i y_i - \sum x_i \sum y_i}{N \sum x_i^2 - (\sum x_i)^2}$$

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$$

$$\frac{\partial}{\partial a_n} (y_i - f(x_i))^2$$