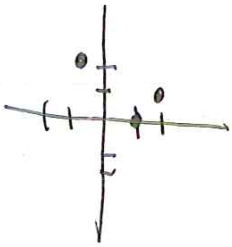
2. Find the equation $f(x) = ax + b$ of the least square line for the points $(1, 0)$, $(-1, 2)$, $(2, 1)$.

$$\begin{bmatrix} 1 & 1 \\ -1 & 1 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}$$

A $\qquad$ B

$$A^T A = \begin{bmatrix} -1 & 1 & 2 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} -1 & 1 \\ 1 & 1 \\ 2 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} 6 & 2 \\ 2 & 3 \end{bmatrix}$$



$$A^T B = \begin{bmatrix} -1 & 1 & 2 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix} = \begin{bmatrix} 4 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 2 & 4 \\ 2 & 3 & 3 \end{bmatrix} \cdot 1/6$$

$$\downarrow$$

$$\begin{bmatrix} 1 & 1/3 & 2/3 \\ 2 & 3 & 3 \end{bmatrix} + (-2)R_1$$

$$\downarrow$$

$$\begin{bmatrix} 1 & 1/3 & 2/3 \\ 0 & 1/3 & 1 \end{bmatrix} + (-1)R_2 \rightarrow \begin{bmatrix} 1 & 0 & -1 \\ 0 & 1/3 & 3 \end{bmatrix} \cdot 3 \rightarrow \begin{matrix} a & b \\ \end{matrix} \begin{bmatrix} 1 & 0 & -3 \\ 0 & 1 & 9 \end{bmatrix}$$

$$a = -3$$

$$b = 9$$

$$f(x) = -3x + 9$$

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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20