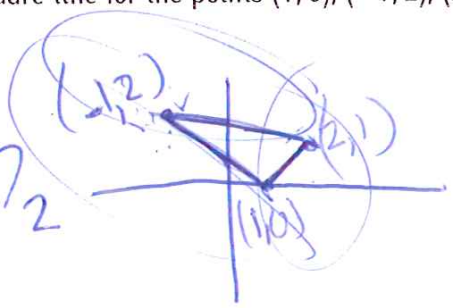
What is b. A_1 A_2 A_3

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

$A = \begin{bmatrix} 1 & 0 \\ -1 & 2 \\ 2 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 0 \\ \sqrt{5} \\ \sqrt{5} \end{bmatrix}$ $A^T = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & 1 \end{bmatrix}$ $A^T B = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & 1 \end{bmatrix} \begin{bmatrix} 0 \\ \sqrt{5} \\ \sqrt{5} \end{bmatrix} = 2$



Least Square

$(A^T A)^{-1}(A^T b) = \begin{bmatrix} x \\ x \end{bmatrix}$

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

$= \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$? 4/20

$\begin{matrix} 2 & 1 \\ 1 & 0 \end{matrix} = \begin{matrix} 1 \\ 1 \end{matrix}$ $\sqrt{1^2+1^2} = \sqrt{2}$

$\begin{matrix} 1 & -1 \\ 0 & 2 \end{matrix} \begin{bmatrix} 2 \\ -2 \end{bmatrix}$ $\sqrt{2^2+2^2} = \sqrt{8}$ $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & 1 \end{bmatrix} \begin{bmatrix} \sqrt{8} \\ \sqrt{10} \\ \sqrt{2} \end{bmatrix} ? = \begin{matrix} \sqrt{8}+\sqrt{10}+2\sqrt{2} \\ 0+2\sqrt{10}+\sqrt{2} \end{matrix}$

$\begin{matrix} 1 & 2 \\ 2 & 1 \end{matrix} = \begin{matrix} -3 \\ 1 \end{matrix}$ $\sqrt{9+1} = \sqrt{10}$

$\begin{matrix} 5 & 0 \\ 0 & 5 \end{matrix} \Big| \begin{matrix} \sqrt{8}+\sqrt{10}+2\sqrt{2} \\ 2\sqrt{10}+\sqrt{2} \end{matrix}$

$\begin{matrix} 2 & 1 \\ 1 & 0 \end{matrix} = \begin{matrix} 1 \\ 1 \end{matrix}$ $\sqrt{1+1}\sqrt{2}$

$f(x) = -\frac{\sqrt{8}}{5} - \frac{\sqrt{10}}{5} + \frac{2\sqrt{2}}{5}x + \frac{2\sqrt{10}}{5} + \frac{\sqrt{2}}{5}$

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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