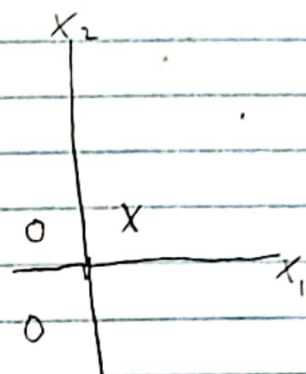


- 1 a. $w_2 = 1$ a straight vertical
 $w_1 = 0$ line best separates
 $w_0 = 0$ these points



- b. margin = 2

$$\begin{aligned} \text{c. } w_1 x_1^{(1)} + w_2 x_2^{(1)} + w_0 &\geq 1 \\ w_1 x_1^{(2)} + w_2 x_2^{(2)} + w_0 &\geq 1 \\ w_1 x_1^{(3)} + w_2 x_2^{(3)} + w_0 &\leq -1 \end{aligned}$$

- d. No, it would not change the weight vector, or λ , as that point would not be a support vector

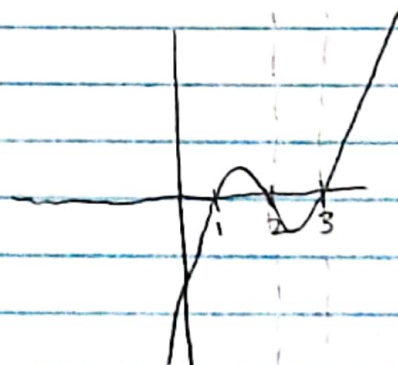
2 a. $\mathcal{L}(x, \lambda) = x^3 - 6x^2 + 11x - 6 - \lambda_1(x-2) - \lambda_2(x-3)$

b. $\frac{\partial \mathcal{L}}{\partial x} = 3x^2 - 12x + 11 - \lambda_1 - \lambda_2$

$\lambda_1(x-2) = 0$

$\lambda_2(x-3) = 0$

$\lambda_1, \lambda_2 \geq 0$



- c. yes, there is a local minimum @ $x=2.577$, and a global min @ $x=2$. λ_2 is not active, therefore $\lambda_2=0$, but λ_1 is active, therefore $\lambda_1 \neq 0$

3. Naïve Bayes classifier addresses curse of dimensionality by assuming all individual features are statistically independent, therefore you can write the pdf for each class as a product of the factors of each class's α -posterior probability