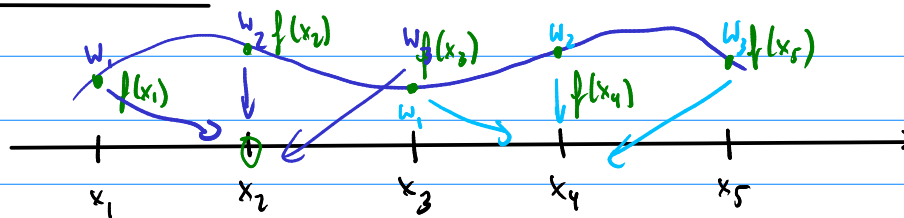


Finite differences



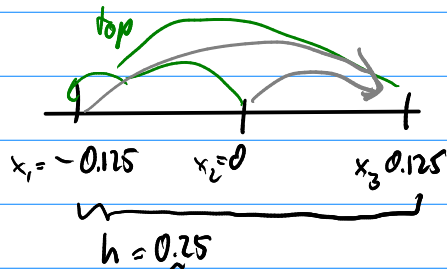
$$V \vec{z} = \begin{pmatrix} f(x_1) \\ f(x_2) \\ f(x_3) \end{pmatrix}$$

$$V' \vec{\alpha} = \begin{pmatrix} \hat{f}'(x_1) \\ \hat{f}'(x_2) \\ \hat{f}'(x_3) \end{pmatrix}$$

$$\begin{array}{|c|} \hline ? \\ \hline \end{array}
 \begin{pmatrix} f(x_1) \\ f(x_2) \\ f(x_3) \end{pmatrix} = \begin{pmatrix} \hat{f}'(x_1) \\ \hat{f}'(x_2) \\ \hat{f}'(x_3) \end{pmatrix}$$

w_1 w_2 w_3

$$w_1 f(x_1) + w_2 f(x_2) + w_3 f(x_3) = \hat{f}'(x_2)$$



$$\hat{f}'(x_2) = 4 \cdot f(x_3) + 0 \cdot f(x_2) - 4 \cdot f(x_1)$$

$$= \frac{f(x_3) - f(x_1)}{h}$$