1.

$L_j(x) = \prod_{\substack{i=0 \\ i \neq j}}^{n} \frac{(x - x_i)}{(x_j - x_i)}$ Δ: $\{x_0, x_1, \dots, x_N\}$ on $[a, b]$ $a = x_0 < x_1 \cdots < x_{N-1} < x_N = b \to$ grid

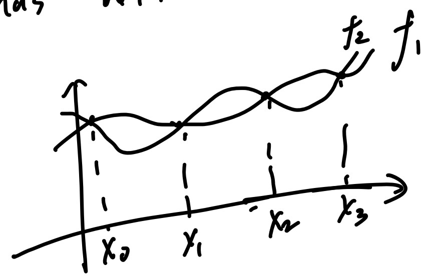
Δ: $h = \max\{x_i\}$

Assume $\hat{f}_1, \hat{f}_2 \in \Pi_N([a, b])$ satisfy

$\hat{f}_1(x_i) = \hat{f}_2(x_i) = y_i \quad \forall i = 0, \dots, N$

we consider $\hat{f}_1 - \hat{f}_2 \in \Pi_N([a, b])$

has $N+1$ roots



$\hat{f}_1 - \hat{f}_2 = 0$

$\hat{f}_1 = \hat{f}_2$. $N = 3$

$\because \hat{f}_1 - \hat{f}_2 = 0$ This means zero degree

$\because f(x) = 1$ is polynomial of zero degree

$\Rightarrow \sum L_j(x) = 1$

$p(x) = \sum y_j L_j(x)$