HW1

便笺标题 2011/3/2

1. 设互异节点 $x_0, x_1, \cdots, x_n$, $l_k(x)$ 为 Lagrange 插值基函数, 证明.

(1) $\sum_k l_k(x) = 1$

(2) $\sum_k x_k^j l_k(x) = x^j \qquad j = 0, 1, \cdots, n$

(3) $\sum_k (x_k - x)^j l_k(x) = 0 \qquad j = 1, \cdots, n$

2. 证明 Newton 差商的各种性质.

3. 对 Lebesgue 常数证明

$$\lambda_n(x; X) = \sum_{k=0}^{n} |l_k(x)|$$

$$\Lambda_n(X) = \| \lambda_n(x; X) \|_\infty .$$