zadanie 5

mamy $x_0 \dots x_n$, $x_i = x_{i-1} + h$ ↖ stałe

$$L_n(x) = \sum_{i=0}^{n} f(x_i)\cdot\lambda_i(x) =$$

$$= \sum_{i=0}^{n} f(x_i)\cdot\prod_{\substack{j=0\\ j\neq i}}^{n}\frac{x-x_j}{x_i-x_j} = \sum_{i=0}^{n} f(x_i)\cdot\prod_{\substack{j=0\\ j\neq i}}^{n}\frac{x-(x_0+j\cdot h)}{(x_0+i\cdot h)-(x_0+j\cdot h)} =$$

$$= \sum_{i=0}^{n} f(x_i)\cdot\prod_{\substack{j=0\\ j\neq i}}^{n}\frac{x-x_0+j\cdot h}{h(i-j)}$$

niech $\underline{\underline{x = x_0 + t\cdot h}}$ $t\in[0,n]$, bo $x\in[x_0,x_n]$

$$= \sum_{i=0}^{n} f(x_i)\cdot\prod_{\substack{j=0\\ j\neq i}}^{n}\frac{\cancel{h}(t-j)}{\cancel{h}(i-j)} = \boxed{\sum_{i=0}^{n} f(x_i)\cdot\prod_{\substack{j=0\\ j\neq i}}^{n}\frac{t-j}{i-j}}$$