$$p_n(x) = \sum_{k=0}^{n} \frac{f^{(k)}(x_0)}{k!}(x - x_0)^k \qquad p_n(x) = \sum_{i=0}^{n} y_i L_i(x) \qquad L_i(x) = \prod_{\substack{k=0 \\ k\neq i}}^{n} \frac{(x - x_k)}{(x_i - x_k)}$$

$$d_k = \frac{c_{k+1} - c_k}{3h_k} \qquad a_k + b_k h_k + c_k {h_k}^2 + d_k {h_k}^3 = a_{k+1}$$

$$f[x_k, x_{k+1}, \dots, x_{k+i}] = \frac{f[x_{k+1}, x_{k+2}, \dots, x_{k+i}] - f[x_k, x_{k+1}, \dots, x_{k+i-1}]}{x_{k+i} - x_k}$$

$$b_k + 2c_k h_k + 3d_k {h_k}^2 = b_{k+1} \qquad X^{(n+1)} = G\left(X^{(n)}\right) \qquad x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

$$A = \begin{bmatrix} 1 & 0 & 0 & 0 & \dots & 0 \\ h_0 & 2(h_0 + h_1) & h_1 & 0 & \dots & 0 \\ 0 & & \ddots & & & \vdots \\ \vdots & & & \ddots & & \vdots \\ 0 & \dots & 0 & h_{n-2} & 2(h_{n-2} + h_{n-1}) & h_{n-1} \\ 0 & \dots & 0 & 0 & 0 & 1 \end{bmatrix} \qquad X = \begin{bmatrix} c_0 \\ c_1 \\ \vdots \\ c_{n-1} \\ c_n \end{bmatrix}$$

$$B = \begin{bmatrix} 0 \\ \frac{3}{h_1}(a_2 - a_1) - \frac{3}{h_0}(a_1 - a_0) \\ \vdots \\ \frac{3}{h_{n-1}}(a_n - a_{n-1}) - \frac{3}{h_{n-2}}(a_{n-1} - a_{n-2}) \\ 0 \end{bmatrix}$$

$$E_T = h^4 \frac{b-a}{180} f^{(iv)}(\xi)$$

$$x_{n+1} = g(x_n)$$

$$E = \frac{\left|X - \underline{X}\right|}{|X|}$$

$$A = \begin{bmatrix} 2h_0 & h_0 & 0 & 0 & \dots & 0 \\ h_0 & 2(h_0 + h_1) & h_1 & 0 & \dots & 0 \\ 0 & & \ddots & & & \vdots \\ \vdots & & & \ddots & & \vdots \\ 0 & \dots & 0 & h_{n-2} & 2(h_{n-2} + h_{n-1}) & h_{n-1} \\ 0 & \dots & 0 & 0 & h_{n-1} & 2h_{n-1} \end{bmatrix}$$

$$n \geq \frac{\log(b-a) - \log \varepsilon}{\log 2}$$

$$Y_{k+1} = Y_k + h f(t_k, Y_k)$$

$$x'(t_j) = \frac{x(t_j) - x(t_{j-1})}{h}$$

$$|E_T| = h^2 \frac{b-a}{12} \left|f''\left(\xi_k(x)\right)\right| \qquad E_T = -h^4 \frac{b-a}{80} f^{(iv)}(\xi) \qquad \sigma^2 = \frac{\sum_{k=0}^{n} (p_m(x_k) - y_k)^2}{N - m - 1}$$

$$\int_a^b f(x)\, dx \approx \frac{h}{2}\left[f(a) + f(b) + 2\sum_{k=1}^{n-1} f(x_k)\right] \qquad d_3 = d_1 + \frac{x(b) - x(b)^{(1)}}{x(b)^{(2)} - x(b)^{(1)}}(d_2 - d_1)$$

$$\frac{\|\hat{X} - X\|}{\|X\|} \leq \frac{Cond(A)}{1 - Cond(A)\,\frac{\|\delta A\|}{\|A\|}}\left(\frac{\|\delta A\|}{\|A\|} + \frac{\|\delta b\|}{\|b\|}\right) \qquad x'(t_j) = \frac{x(t_{j+1}) - x(t_{j-1})}{2h}$$

$$x_{n+1} = x_n - \frac{f(x_n)\,(x_n - x_{n-1})}{f(x_n) - f(x_{n-1})} \qquad X^{(n+1)} = -D^{-1}(L + U)X^{(n)} + D^{-1}b$$

$$X^{(n+1)} = (D + L)^{-1}(-U)X^{(n)} + (D + L)^{-1}b$$

$$B=\begin{bmatrix} \frac{3}{h_0}(a_1-a_0)-3f'(x_0) \\ \frac{3}{h_1}(a_2-a_1)-\frac{3}{h_0}(a_1-a_0) \\ \vdots \\ \frac{3}{h_{n-1}}(a_n-a_{n-1})-\frac{3}{h_{n-2}}(a_{n-1}-a_{n-2}) \\ 3f'(x_n)-\frac{3}{h_{n-1}}(a_n-a_{n-1}) \end{bmatrix}$$

$$c=\frac{a\,f(b)-b\,f(a)}{f(b)-f(a)}$$

$$c=\frac{a+b}{2}$$

$$E=\left|X-\underline{X}\right|$$

$$\sum_{i=0}^{m}\left(a_i\sum_{k=0}^{n}x_k^{i+j}\right)=\sum_{k=0}^{n}x_k^j y_k$$

$$\int_a^b f(x)\,dx\approx\frac{16\big(S(a,c)+S(c,b)\big)-S(a,b)}{15}$$

$$\int_a^b f(x)\,dx\approx\frac{3h}{8}\left[f(a)+f(b)+3\sum_{k=0}^{\frac{n-3}{3}}f(x_{3k+1})+3\sum_{k=0}^{\frac{n-3}{3}}f(x_{3k+2})+2\sum_{k=1}^{\frac{n-3}{3}}f(x_{3k})\right]$$

$$x'(t_j)=\frac{x(t_{j+1})-x(t_j)}{h}$$

$$R_{k,1}=\frac{1}{2}\left\{R_{k-1,1}+h_{k-1}\sum_{i=1}^{2^{k-2}}f\left(a+\frac{2i-1}{2}h_{k-1}\right)\right\}$$

$$R_{i,j}=\frac{4^{j-1}R_{i,j-1}-R_{i-1,j-1}}{4^{j-1}-1}$$

$$Y_{k+1}=Y_k+h\,Y_k'+\frac{h^2}{2}Y_k''+\cdots$$

$$\int_a^b f(x)\,dx\approx\frac{h}{3}\left[f(a)+f(b)+4\sum_{k=0}^{\frac{n-2}{2}}f(x_{2k+1})+2\sum_{k=1}^{\frac{n-2}{2}}f(x_{2k})\right]$$

$$Y_{k+1}=Y_k+\frac{1}{6}(K_1+2K_2+2K_3+K_4)\quad con\quad\begin{cases} K_1=h\,f(t_k,Y_k) \\ K_2=h\,f\left(t_k+\frac{1}{2}h,Y_k+\frac{1}{2}K_1\right) \\ K_3=h\,f\left(t_k+\frac{1}{2}h,Y_k+\frac{1}{2}K_2\right) \\ K_4h\,f(t_k+h,Y_k+K_3) \end{cases}$$

$$Y_{k+1}=Y_k+\frac{h}{2}\left[f(t_k,Y_k)+f\big(t_{k+1},Y_k+h\,f(t_k,Y_k)\big)\right]$$

$$E=\sqrt{\frac{\sum_{k=0}^{n}(p_m(x_k)-y_k)^2}{N}}$$

$$x''(t_j)=\frac{x(t_{j+1})-2x(t_j)+x(t_{j-1})}{h^2}$$

$$E=\sum_{k=0}^{n}(p_m(x_k)-y_k)^2$$

$$E(x)\approx\left|\frac{(x-x_0)(x-x_1)\ldots(x-x_n)}{(n+1)!}\,f^{(n+1)}\big(\xi(x)\big)\right|$$

$$E(x)\approx f[x_0,x_1,\ldots,x_n,x](x-x_0)(x-x_1)\ldots(x-x_n)$$