$$f'(x_0) \approx \frac{1}{12h}\left(f_{i-2} - 8f_{i-1} + 8f_{i+1} - f_{i+2}\right) = -\frac{f_{i+2} - f_{i-2}}{4h}\cdot\frac{1}{3} + \frac{f_{i+1} - f_{i-1}}{2h}\cdot\frac{4}{3}$$

$$\left| f'(x_0) - \frac{f(x_0+h) - f(x_0-h)}{2h}\cdot\frac{4}{3} + \frac{f(x_0+2h) - f(x_0-2h)}{4h}\cdot\frac{1}{3} \right| =$$

$$= \left| f'(x_0) - \frac{4}{3}\left(f'(x_0) + \frac{f'''(x_0)}{6}h^2 + \frac{2f^{(5)}(\xi_1)}{120\cdot 2h}h^5\right) + \frac{1}{3}\left(f'(x_0) + \frac{2f'''(x_0)}{6\cdot 4h}\cdot 8h^3 + \frac{2f^{(5)}(\xi_2)}{120\cdot 4h}\cdot 32h^5\right)\right| =$$

$$= \left| -\frac{4}{3}\,\frac{f^{(5)}(\xi_1)}{120}h^4 + \frac{16}{3}\,\frac{f^{(5)}(\xi_2)}{120}h^4 \right| \le \frac{20}{3}\,\frac{M_5}{120}h^4 = \frac{M_5}{18}h^4 = \varepsilon_{method}$$

$$\varepsilon_{comp} = \frac{1}{12h}\left(\Delta f + 8\Delta f + 8\Delta f + \Delta f\right) = \frac{18\Delta f}{12h}$$

$$\varepsilon_{total} = \frac{18\Delta f}{12h} + \frac{M_5 h^4}{18}, \quad \left(\varepsilon_{total}\right)'_h = \frac{2M_5}{9}h^3 - \frac{18\Delta f}{12h^2} = 0$$

$$h^5 = \frac{9\cdot 18\Delta f}{2\cdot 12 M_5} = \frac{27}{4}\,\frac{\Delta f}{M_5} \Rightarrow h^* \approx \frac{3}{2}\cdot\sqrt[5]{\frac{\Delta f}{M_5}}$$