MAC0210 - Capítulo 14

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Exercício 3

$$f(x_0+h) = f(x_0) + hf'(x_0) + \frac{h^2}{2}f''(x_0) + \frac{h^3}{3!}f'''(x_0) + \frac{h^4}{4!}f^{(4)}(x_0) + \frac{h^5}{5!}f^{(5)}(x_0) + \frac{h^6}{6!}f^{(6)}(x_0) + \frac{h^7}{7!}f^{(7)}(\xi)$$

$$f(x_0+2h) = f(x_0) + 2hf'(x_0) + \frac{2h^2}{2}f''(x_0) + \frac{2h^3}{3!}f'''(x_0) + \frac{2h^4}{4!}f^{(4)}(x_0) + \frac{2h^5}{5!}f^{(5)}(x_0) + \frac{2h^6}{6!}f^{(6)}(x_0) + \frac{2h^7}{7!}f^{(7)}(\xi)$$

$$f(x_0+3h) = f(x_0) + 3hf'(x_0) + \frac{3h^2}{2}f''(x_0) + \frac{3h^3}{3!}f'''(x_0) + \frac{3h^4}{4!}f^{(4)}(x_0) + \frac{3h^5}{5!}f^{(5)}(x_0) + \frac{3h^6}{6!}f^{(6)}(x_0) + \frac{3h^7}{7!}f^{(7)}(\xi)$$

$$f(x_0-h) = f(x_0) - hf'(x_0) + \frac{h^2}{2}f''(x_0) - \frac{h^3}{3!}f'''(x_0) + \frac{h^4}{4!}f^{(4)}(x_0) - \frac{h^5}{5!}f^{(5)}(x_0) + \frac{h^6}{6!}f^{(6)}(x_0) - \frac{h^7}{7!}f^{(7)}(\xi)$$

$$f(x_0-2h) = f(x_0) - 2hf'(x_0) + \frac{2h^2}{2}f''(x_0) - \frac{2h^3}{3!}f'''(x_0) + \frac{2h^4}{4!}f^{(4)}(x_0) - \frac{2h^5}{5!}f^{(5)}(x_0) + \frac{2h^6}{6!}f^{(6)}(x_0) - \frac{2h^7}{7!}f^{(7)}(\xi)$$

$$f(x_0-3h) = f(x_0) - 3hf'(x_0) + \frac{3h^2}{2}f''(x_0) - \frac{3h^3}{3!}f'''(x_0) + \frac{3h^4}{4!}f^{(4)}(x_0) - \frac{3h^5}{5!}f^{(5)}(x_0) + \frac{3h^6}{6!}f^{(6)}(x_0) - \frac{3h^7}{7!}f^{(7)}(\xi)$$

$$f(x_0-h)+f(x_0+h)=2f(x_0)+h^2f''(x_0)+\frac{h^4}{12}f^{(4)}(x_0)+\frac{h^6}{360}f^{(6)}(x_0)$$
$$f(x_0-2h)+f(x_0+2h)=2f(x_0)+2h^2f''(x_0)+\frac{h^4}{8}f^{(4)}(x_0)+\frac{h^6}{180}f^{(6)}(x_0)$$
$$f(x_0-3h)+f(x_0+3h)=2f(x_0)+4h^2f''(x_0)+\frac{h^4}{4}f^{(4)}(x_0)+\frac{h^6}{90}f^{(6)}(x_0)$$