

Brayan Leon

Taller 12

$$\tilde{x} = 1,3, \quad \Delta \tilde{x} = 0,05, \quad \text{¿error resultante?}$$

$$f(x) = 1,2x^4 - 2,1x^3 + 0,8x^2 - 3x + 5$$

$$\begin{aligned} x &\in [\tilde{x} - \Delta \tilde{x}, \tilde{x} + \Delta \tilde{x}] \\ x &\in [1,3 - 0,05, 1,3 + 0,05] \\ x &\in [1,25, 1,35] \end{aligned} \quad \left\{ \begin{aligned} \Delta f(\tilde{x}) &= |4,8x^3 - 6,3x^2 + 1,6x - 3| \times 0,05 \\ \Delta f(\tilde{x}) &= |4,8(1,3)^3 - 6,3(1,3)^2 + 1,6(1,3) - 3| \times 0,05 \\ \Delta f(\tilde{x}) &= +0,05107 \end{aligned} \right.$$

$$\begin{aligned} f(x) &= 1,2x^4 - 2,1x^3 + 0,8x^2 - 3x + 5 \\ f'(x) &= 4,8x^3 - 6,3x^2 + 1,6x - 3 \end{aligned} \quad \left\{ \begin{aligned} f(x) &\in [f(\tilde{x}) - \Delta f(\tilde{x}), f(\tilde{x}) + \Delta f(\tilde{x})] \\ f(x) &\in [1,26562 - 0,05107, 1,26562 + 0,05107] \\ f(x) &\in [1,21455, 1,31669] \end{aligned} \right.$$

$$\begin{aligned} f(1,3) &= 1,2(1,3)^4 - 2,1(1,3)^3 + 0,8(1,3)^2 - 3(1,3) + 5 \\ f(1,3) &= 1,26562 \end{aligned}$$

$$\tilde{x} = \frac{\pi}{4}, \quad \Delta \tilde{x} = 0,005$$

$$\begin{aligned} f(x) &= \cos(x) \times \ln(2x) \\ x &\in [\tilde{x} - \Delta \tilde{x}, \tilde{x} + \Delta \tilde{x}] \\ x &\in [\frac{\pi}{4} - 0,005, \frac{\pi}{4} + 0,005] \\ x &\in [0,780398, 0,790398] \end{aligned} \quad \left\{ \begin{aligned} \Delta f(\tilde{x}) &= \left| \frac{\cos x}{2x} - \sin(x) \times \ln(2x) \right| \times 0,005 \\ \Delta f(\tilde{x}) &= 0,130844 \times 0,005 = 0,000654 \\ f(x) &\in [f(\tilde{x}) - \Delta f(\tilde{x}), f(\tilde{x}) + \Delta f(\tilde{x})] \\ f(x) &\in [0,319317 - 0,000654, 0,319317 + 0,000654] \\ f(x) &\in [0,318663, 0,319971] \end{aligned} \right.$$

$$f(x) = \cos(x) \times \ln(2x)$$

$$f'(x) = \cos(x) \times \frac{1}{2x} + (-\sin(x)) \times \ln(2x)$$

$$f'(x) = \frac{\cos x}{2x} - \sin(x) \times \ln(2x)$$

$$f\left(\frac{\pi}{4}\right) = \cos\left(\frac{\pi}{4}\right) \times \ln\left(2 \times \frac{\pi}{4}\right)$$

$$f\left(\frac{\pi}{4}\right) = 0,319317$$