Día Mes Año

Notas:

Taller 11

- Dado un valor de $\tilde{x} = 1.3$ con un error $\Delta\tilde{x} = 0.05$, estime el valor del error resultante en la función

$$f(x) = 1.2x^4 - 2.1x^3 + 0.8x^2 - 3x + 5$$

$$\Delta f(\tilde{x}) = |f(x) - f(\tilde{x})|$$

$$\Delta f(\tilde{x}) \approx |f'(\tilde{x})| \cdot \Delta\tilde{x}$$

$$f'(x) = 4.8x^3 - 6.3x^2 + 1.6x - 3$$

$$\Delta f(1.3) \approx |4.8(1.3)^3 - 6.3(1.3)^2 + 1.6(1.3) - 3|(0.05)$$

$$\approx 0.05107$$

$$f(x) \in [f(\tilde{x}) - \Delta f(\tilde{x}),\ f(\tilde{x}) + \Delta f(\tilde{x})]$$

$$f(\tilde{x}) \approx 1.2(1.3)^4 - 2.1(1.3)^3 + 0.8(1.3)^2 - 3(1.3) + 5$$

$$\approx 1.26562$$

$$f(x) \in [1.21455,\ 1.31669]$$

Notas:

- Dado un valor de $\tilde{x} = \pi/4$ con un error $\Delta\tilde{x} = 0.005$, estime el error resultante de la función.

$$f(x) = \cos(x)\ln(2x) \qquad (x/4 = 45)$$

$$f'(x) = \frac{\cos(x)}{x} - \operatorname{sen}(x)\ln(2x)$$

$$f(\tilde{x}) \cong \cos(45)\ln(2(45)) = 3.181845$$

$$\Delta f(45) \tilde{=} \left| \frac{\cos(45)}{45} - \operatorname{sen}(45)\ln(2(45)) \right| (0.005)$$

$$\tilde{=} 0.015830$$

$$f(x) \in [3.166015,\ 3.197675]$$