Taller 9 - Daniel Amado.

① $x_i = 0,4$ $\quad f(x) = 1,2x^3 - 1,5x^2 + 3x - 7$

$x_{i+1} = 0,5$ $\quad f'(x) = 3,6x^2 - 3x + 3$

$h = 0,1$ $\quad f''(x) = 7,2x - 3$

$f'''(x) = 7,2$

Orden 0

$$f(0,5) \approx f(0,4)$$
$$= 1,2(0,4)^3 - 1,5(0,4)^2 + 3(0,4) - 7$$
$$= -5,9632$$

Orden 1

$$f(0,5) \approx -5,9632 + f'(0,4)(0,1)$$
$$= -5,9632 + (3,6(0,4)^2 - 3(0,4) + 3)(0,1)$$
$$= -5,9632 + 0,2376$$
$$= -5,7256$$

Orden 2

$$f(0,5) \approx -5,7256 + \frac{f''(0,4)}{2!}(0,1)^2$$

$$\approx -5,7256 + \frac{7,2(0,4) - 3}{2!}(0,1)^2$$

$$= -5,7256 - 6 \times 10^{-4}$$
$$= -5,7262$$

Orden 3

$$f(0,5) = -5,7262 + \frac{f'''(0,4)}{3!}(0,1)^3$$

$$= -5,7262 + \frac{7,2}{3!}(0,1^3)$$

$$= -5,7262 + 1,2 \times 10^{-3}$$
$$= -5,725$$

② $x_i = 0,4$ $\quad f(x) = 2,1e^x - 4,5x + 2,25$

$x_{i+1} = 0,5$ $\quad f'(x) = 2,1e^x - 4,5$

$h = 0,1$ $\quad f''(x) = 2,1e^x$

$f'''(x) = 2,1e^x$

Orden 0

$$f(0,5) \approx f(0,4)$$
$$= 2,1e^{(0,4)} - 4,5(0,4) + 2,25$$
$$= 3,5828$$

Orden 1

$$f(0,5) \approx 3,5828 + f'(0,4)(0,1)$$
$$= 3,5828 + (2,1e^{0,4} - 4,5)(0,1)$$
$$= 3,5828 - 0,1367$$
$$= 3,4461$$

Orden 2

$$f(0,5) \approx 3,4461. + \frac{f''(0,4)}{2!}(0,1)^2$$

$$\approx 3,4461 + \frac{2,1e^{0,4}}{2!}(0,1)^2$$
$$= 3,4461 + 0,01566$$
$$= 3,4617$$

Orden 3

$$f(0,5) = 3,4617 + \frac{f'''(0,4)}{3!}(0,1)^3$$

$$= 3,4617 + \frac{2,1e^{0,4}}{3!}(0,1)^3$$

$$= 3,4617 + 5,2213 \times 10^{-4}$$
$$= 3,4628$$