1). • 155, 4087104999 ⟶ 155,41

• 0,7549108999 ⟶ 0,75491

• 709,4309999997 ⟶ 709,43

• 637,9980000009 ⟶ 638

• 4,9995999999 ⟶ 4,9996

2). $\tilde{x} = 0,5 \quad \Delta\tilde{x} = 0,001 \quad f(x) = 3\operatorname{sen}(x^2-1)$

$f'(x) = 6x\cos(x^2-1)$

$f(\tilde{x}) = |6(0,5)\cos(0,5^2-1)| * 0,001$

$= [illegible]^3 \; 2,1950 \times 10^{-3}$

$f(x) \in [0,010893 \; , \; 0,0152840]$

3). $f(x) = 0,75x^4 - 1,25x^3 + 2,5x + 0,5 \qquad x = 3$

[illegible] = [illegible]

* $f'(x) = 3x^3 - 3,75x^2 + 2,5$ $\qquad h = 3,001 - 3$
$h = 0,001$

* $f''(x) = 9x^2 - 7,5x$

* $f'''(x)$ $18x - 7,5$

Orden 0

[illegible] $f(3,001) = 35$

Orden 1

[illegible]

→ Orden 1.

$f(3,001) \cong 35,04\,(49,75 * 0,001) = 35,08975$

→ Orden 2

$f(3,001) \cong \text{orden 1} + \left(\frac{f''(3)}{2!}\right) \cdot h^2$

$= 35,08975 + \left(\frac{58,5}{2!}\right) \cdot (0,001)^2 = 35,08977925$

→ Orden 3

$f(3,001) = \text{orden 2} + \left(\frac{f'''(3)}{3!}\right) \cdot h^3$

$= 35,08977925 + \left(\frac{46,5}{3!}\right) \cdot (0,001)^3 = 35,08977926$

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

$x = 3$

tamaño incremento = 0,001

$f(x) = 48,6 + 8,1 - 13,5 - 1,8 + 3 + 2 \quad f(x_{i+1}) = 46,47815472$

$= 46,4$

$f'(x) = x^4 + 0,4x^3 - 1,5x^2 - 0,4x + 1 \quad f(x_{i-1}) = 46,32195468$

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

→ Diferencia Finita hacia adelante

$$f'(x_i) = \frac{f(x_{i+1}) - f(x_i)}{h} = \frac{46,47815472 - 46,4}{0,001} = 78,15472$$

$$f''(x_i) = \frac{f(x_{i+2}) - 2f(x_{i+1}) + f(x_i)}{h^2} =$$

$$= \frac{46,55641895 - 2(46,47815472) + 46,4}{0,001^2}$$

$= 109,51$

→ Diferencia Finita haga atrás

$$f'(x_i) = \frac{f(x_i) - f(x_i - 1)}{h} = \frac{46,4 - 46,32195468}{0,001}$$

$= 78,04532$

$$f''(x_i) = \frac{f(x_i) - 2f(x_i - 1) + f(x_i - 2)}{h^2}$$

$$= \frac{46,4 - 2(46,32195468) + 46,24401865}{0,001^2} = 109,29$$

→ Diferencia Finita centrada

$$f'(x_i) \doteq \frac{f(x_{i+1}) - f(x_{i-1})}{2h} = \frac{46,47815472 - 46,32195468}{2 \cdot 0,001}$$

$\doteq 78,10002$

$$f''(x_i) = \frac{f(x_{i+1}) - 2f(x_i) + f(x_{i-1})}{h^2}$$

$$= \frac{46,47815472 - 2(46,4) + 46,32195468}{0,001^2} \doteq 109,4$$

• Valores verdaderos

$f'(3) = 78,1$

$f''(3) = 109,4$