

Taller 10

1. $f(x) = 0,25x^4 - 0,35x^2 + 2,5$ $x = 0,5$ $h = 0,1$

* $x_i = 0,5$ $f(0,5) = 2,428125$ $f'(0,5) = -0,575$

$x_{i+1} = 0,6$ $f(0,6) = 2,4064$ $f''(0,5) = 0,75$

$x_{i+2} = 0,7$ $f(0,7) = 2,388525$ $f'(x) = 1x^3 - 0,7$

$x_{i-1} = 0,4$ $f(0,4) = 2,4504$ $f''(x) = 3x^2$

$x_{i-2} = 0,3$ $f(0,3) = 2,470525$

* Hacia adelante

$$f'(0,5) = \frac{f(x_{i+1}) - f(x_i)}{h} = \frac{2,4064 - 2,428125}{0,1} = -0,21725$$

$$f''(0,5) = \frac{f(x_{i+2}) - 2f(x_{i+1}) + f(x_i)}{h^2} = \frac{2,388525 - 2(2,4064) + 2,428125}{(0,1)^2} = 0,385$$

* Hacia atras

$$f'(0,5) = \frac{f(x_i) - f(x_{i-1})}{h} = \frac{2,428125 - 2,4504}{0,1} = -0,22275$$

$$f''(0,5) = \frac{f(x_i) - 2f(x_{i-1}) + f(x_{i-2}))}{h^2} = \frac{2,428125 - 2(2,4504) + 2,470525}{(0,1)^2} = -0,215$$

* Centrado

$$f'(0,5) = \frac{f(x_{i+1}) - f(x_{i-1}))}{2h} = \frac{2,4064 - 2,4504}{2(0,1)} = -0,11375$$

$$f''(0,5) = \frac{f(x_{i+1}) - 2f(x_i) + f(x_{i-1}))}{h^2} = \frac{2,4064 - 2(2,428125) + 2,4504}{(0,1)^2} = 0,055$$

$$2. f(x) = 0,25x^4 - 0,35x^2 + 2,5$$

$$x = 0,5$$

$$h = 0,05$$

$$x_i = 0,5 \quad f(0,5) = 2,428125$$

$$f'(0,5) = -0,575$$

$$x_{i+1} = 0,55 \quad f(0,55) = 2,417001563$$

$$f''(0,5) = -0,75$$

$$x_{i-1} = 0,45 \quad f(0,45) = 2,439376563$$

$$f'(0,5) = \frac{f(x_{i+1}) - f(x_{i-1}))}{2h} = \frac{2,417001563 - 2,439376563}{2(0,05)} = -0,22375$$

$$f''(0,5) = \frac{f(x_{i+1}) - 2f(x_i) + f(x_{i-1}))}{h^2} = \frac{2,417001563 - 2(2,428125) + 2,439376563}{(0,05)^2} = 0,0512504$$

* Son mas cercanos al valor verdadero