Taller #10

1. $f(x) = 0,25x^4 - 0,35x^2 + 3,5$

$x = 0,5 \quad h = 0,1$

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

$x_i + 1 = 0,6 \quad f(0,6) = 2,4064$

$x_i + 2 = 0,7 \quad f(0,7) = 2,388525$

$x_i - 1 = 0,4 \quad f(0,4) = 2,4504$

$x_i - 2 = 0,3 \quad f(0,3) = 2,470525$

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

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

$f'(x) = 1x^3 - 0,7$

$f''(x) = 3x^2$

. hacia delante

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

$$f''(0,5) = \frac{f(x_i+2) - 2f(x_i+1) + f(x_i)}{h^2}$$

$$= \frac{2,388525 - 2(2,4064) + 2,428125}{(0,1)^2} = 0,385$$

* hacia atras

$$f'(0,5) = \frac{f(xi) - f(xi-1)}{h} = \frac{2,428125 - 2,4504}{0,1} = -0,022275$$

$$f''(0,5) = \frac{f(xi) - 2f(xi-1) + f(xi-2)}{h^2}$$

$$= \frac{2,428125 - 2(2,4504) + 2,4705625}{(0,1)^2} = -0,215$$

* centrado

$$f'(0,5) = \frac{f(xi+1) - f(xi-1)}{2h} = \frac{2,428125 - 2,4504}{2(0,1)} = -0,111375$$

$$f''(0,5) = \frac{f(xi+1) - 2f(xi) + f(xi-1)}{h^2}$$

$$= \frac{2,4064 - 2(2,428125) + 2,4504}{(0,1)^2} = 0,055$$