

## Taller 10

•  $x = 0,5$   
 $h = 0,1$

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

$$\begin{aligned} f(x_{i+1}) &= 2,4064 \\ f(x_i) &= 2,428125 \\ f(x_{i+2}) &= 2,388525 \\ f(x_{i-1}) &= 2,4509 \\ f(x_{i-2}) &= 2,490525 \end{aligned}$$

• Primera hacia adelante

$$f'(x_i) = \frac{f(x_{i+1}) - f(x_i)}{h} + oh \Rightarrow \frac{(2,4064) - (2,428125)}{0,1} + oh \Rightarrow -0,2192 //$$

• Primera hacia atrás

$$f'(x_i) = \frac{f(x_i) - f(x_{i-1})}{h} + oh \Rightarrow \frac{(2,428125) - (2,4509)}{0,1} + oh \Rightarrow -0,22775 //$$

• Primera centrada

$$f'(x_i) = \frac{f(x_{i+1}) - f(x_{i-1}))}{2h} + oh^2 \Rightarrow \frac{(2,4064) - (2,4509)}{2(0,1)} + oh^2 \Rightarrow -0,22 //$$

• Valor verdadero

$$x^3 - 0,7x = (0,5)^3 - 0,7(0,5) = -0,225 //$$

• Segunda hacia adelante

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

• Segunda hacia atrás

$$f''(x_i) = \frac{f(x_i) - 2f(x_{i-1}) + f(x_{i-2}))}{h^2} + oh \Rightarrow \frac{(2,428125) - 2(2,4509) + (2,490525)}{(0,1)^2} + oh \Rightarrow -0,215 //$$

• Segunda central

$$f''(x_i) = \frac{f(x_{i+1}) - 2f(x_i) + f(x_{i-1}))}{h^2} + oh^2 \Rightarrow \frac{(2,4064) - 2(2,428125) + (2,4509)}{(0,1)^2} + oh^2 \Rightarrow 0,055 //$$

• Valor verdadero

$$3x^2 - 0,7 = 3(0,5)^2 - 0,7 = 0,05 //$$

• Primera Central

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

$$\frac{(2,417001563) - (2,439376563)}{2(0,05)} + O(h^2) = -0,22375 //$$

• Segunda central

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

$$\frac{(2,417001563) - 2(2,428125) + (2,439376563)}{(0,05)^2} + O(h^2) = 0,0512504 //$$

• Rta: Los del punto 2 es mas parecido al valor anterior.

$$f(x_{i-1}) = 2,439376563$$

$$f(x_i) = 2,428125$$

$$f(x_{i+1}) = 2,417001563$$