3.7 Derivación

$$f'(x) = \frac{f(x+h) - f(x-h)}{2h}$$

$$f''(x) = \frac{f(x+2h) + f(x-2h) - 2f(x)}{4h^2}$$

$$f'''(x) = \frac{f(x+4h) + f(x) - 2f(x+2h)}{16h^4} + \frac{f(x) - f(x-4h) - 2f(x-2h)}{16h^4} - \frac{2f''(x)}{4h^2}$$

$$f'''(x) = \frac{f(x+4h) - 4f(x+2h) + 4f(x-2h) + f(x-4h) + 6f(x)}{16h^4}$$

$x + 2h = x_i + 1$

$$\Rightarrow f'''(x) = \frac{f(x_i+2) - 4f(x_i+1) + 6f(x_i) - 4f(x_i-1) + f(x_i-2)}{16h^4}$$

$$f''''(x) \cong \frac{f(x_i+2) - 4f(x_i+1) + 6f(x_i) - 4f(x_i-1) + f(x_i-2)}{h^4}$$

- ¿Cual es el orden Oh^k de la aproximación?

$-h^2$