

4)a) Llamamos  $x = 2^{1/2}$  Notar que  $x^2 = 2$

$$(i) f = (x-1)^6$$

$$f = (x-1)^6 \cdot \frac{(x+1)^6}{(x+1)^6} = \frac{(x^2-1)^6}{(x+1)^6} = \frac{1}{(x+1)^6} \rightarrow (ii)$$

$$f = [(x-1)^2]^3 = (x^2 - 2x + 1)^3 = (3 - 2x)^3 \rightarrow (iii)$$

$$f = (3 - 2x)^3 \cdot \frac{(3+2x)^3}{(3-2x)^3} = \frac{(9-4x^2)^3}{(3+2x)^3} = \frac{1}{(3+2x)^3} \rightarrow (iv)$$

$$f = (3 - 2x)^3 = 27 - 54x + 36x^2 - 8x^3 = 99 - 70x \rightarrow (v)$$

$$f = (99 - 70x) \frac{(99 + 70x)}{(99 + 70x)} = \frac{9801 - 4900x^2}{99 + 70x} = \frac{1}{99 + 70x} \rightarrow (vi)$$

b)  $x = 1,4 \pm 0,05$      $\Delta x = 0,05$

$$(i) \quad \Delta f = 6 \cdot (x-1)^5 \cdot \Delta x = \mathbf{0,061} \cdot \Delta x$$

$$(ii) \quad \Delta f = 6 / (x+1)^7 \cdot \Delta x = \mathbf{0,013} \cdot \Delta x$$

$$(iii) \quad \Delta f = 6 \cdot (3-2x)^2 \cdot \Delta x = \mathbf{0,24} \cdot \Delta x$$

$$(iv) \quad \Delta f = 6 / (3+2x)^4 \cdot \Delta x = \mathbf{0,0053} \cdot \Delta x$$

$$(v) \quad \Delta f = 70 \cdot \Delta x = \mathbf{70} \cdot \Delta x$$

$$(vi) \quad 70 / (99+70x)^2 \cdot \Delta x = \mathbf{0,0018} \cdot \Delta x \quad \leftarrow \mathbf{MEJOR}$$

Factor de Amplificación  
de error absoluto

Enfatizar que algoritmos algebraicamente equivalentes no son numéricamente equivalentes: propagan de forma distinta los errores.