Jose David Morales U00137642 / Parcial #2

Parcial #2

1) 155,4087104999 => 155,41

   637,9980000009 => 638,00

   0,754910899 => 0,75491

   4,999599999 => 4,9996

   709,43099997 => 709,43

2) $\tilde{x} = 0{,}5\ y\ \Delta\tilde{x} = 0{,}001$

$$f(x) = 3sen(x^2 - 1)$$

$$f'(x) = 6x\cos(x^2 - 1)$$

$$x\ e\ [0{,}5 - 0{,}001\ ;\ \ 0{,}5 + 0{,}001]$$

$$x\ e\ [0{,}499\ ;\ \ 0{,}501]$$

$$\Delta f(0{,}5) = 3\cos(-0{,}75) = 2{,}997$$

$$f(x) = 3\ sen\big((0{,}5^2 - 1)\big) = -0{,}04$$

$$f(x) e\ [-3{,}04\ ;\ \ 2{,}96]$$

3) $f(x) = 0{,}75x^5 + 0{,}1x^4 - 0{,}5x^3 - 0{,}2x^2 + x + 2$

Orden Cero

$$f(3{,}001) = 0{,}75(3)^5 + 0{,}1(3)^4 - 0{,}5(3)^3 - 0{,}2(3)^2 + (3) + 2$$
$$= 181{,}85$$

$$Error = \frac{181{,}85 - 180{,}354}{180{,}354} x100 = 0{,}83\%$$

Orden Uno

$$f(3{,}001) = 180{,}05 + \frac{f'(x-3)}{1!}$$

$$= 180{,}05 + 300{,}85(x - 3)$$

Orden Dos

$$f(3{,}001) = 180{,}05 + \frac{f'(x-3)}{1!} - \frac{f''(x-3)}{2!}$$

$$= 180{,}05 + 300{,}85(x - 3)$$

4) $f(x) = 0{,}2x^5 + 0{,}1x^4 - 0{,}5x^3 - 0{,}2x^2 + x + 2$

$$f(xi) = f(3) = 46{,}4$$
$$f(xi + i) = f(3{,}001) = 46{,}48$$
$$f(xi - i) = f(2{,}999) = 46{,}32$$
$$f(xi + 2) = f(3{,}002) = 46{,}56$$
$$f(xi - 2) = f(2{,}998) = 46{,}24$$

Primera diferencia hacia adelante

$$f'(3) = \frac{f(xi + i) - f(xi)}{0{,}001} = \frac{46{,}48 - 46{,}4}{0{,}001} = 78{,}15$$

Primera diferencia hacia atrás

$$f'(3) = \frac{f(xi) - f(xi - i)}{0{,}001} = \frac{46{,}4 - 46{,}32}{0{,}001} = 78{,}1$$

Primera diferencia Centrada

$$f'(3) = \frac{f(xi + i) - f(xi - i)}{0{,}001} = \frac{46{,}48 - 46{,}32}{2(0{,}001)} = 78{,}13$$

Segunda diferencia hacia adelante

$$f''(3) = \frac{46{,}48 - 2(46{,}4) + 46{,}4}{0{,}001^2} = 118$$

Segunda diferencia hacia atrás

$$f''(3) = \frac{46{,}4 - 2(46{,}32) + 46{,}24}{0{,}001^2} = 210$$

Segunda diferencia Centrada

$$f''(3) = \frac{46{,}48 - 2(46{,}4) + 46{,}32}{0{,}001^2} = 50$$