Reporte de Laboratorio #8

# Ejercicio #1

## a)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | **f(x)** | **1** | **2** | **3** | **4** | **5** |
| -3 | 9.367879 |  |  |  |  |  |
|  |  | -5.67319 |  |  |  |  |
| -2.8 | 8.233241 |  | 1.0218375 |  |  |  |
|  |  | -5.264455 |  | 0.0025625 |  |  |
| -2.6 | 7.18035 |  | 1.023375 |  | 1.04167E-04 |  |
|  |  | -4.855105 |  | 2.64583E-03 |  | 2.08333E-04 |
| -2.4 | 6.209329 |  | 1.0249625 |  | 3.12500E-04 |  |
|  |  | -4.44512 |  | 2.89583E-03 |  |  |
| -2.2 | 5.320305 |  | 1.0267 |  |  |  |
|  |  | -4.03444 |  |  |  |  |
| -2 | 4.513417 |  |  |  |  |  |

## b)

|  |  |  |  |
| --- | --- | --- | --- |
| **P(x)** | **-2,333333333** |  | **error relativo** |
| Polinomio Grado 5 | 5,903870348 | 5,903870268 | 0,00000001354063035 |
| Polinomio Grado 4 | 5,903870502 | 5,903870268 | 0,00000003956341033 |
| Polinomio Grado 3 | 5,903869926 | 5,903870268 | 0,00000005802201402 |
| Polinomio Grado 3 | 5,903679284 | 5,903870268 | 0,00003234903903 |

# Ejercicio #2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Interpolacion de Newton  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **x** | **f(x)** | **1** | **2** | **3** | | 0 | -0,5 |  |  |  | |  |  | 0,9 |  |  | | 1 | 0,4 |  | 0,1 |  | |  |  | 1,1 |  | 0,1 | | 2 | 1,5 |  | 0,4 |  | |  |  | 1,9 |  |  | | 3 | 3,4 |  |  |  | | |  |  |  | | --- | --- | --- | | **P(x)** | **1,25** | **2,1** | |  | 0,6328125 | 1,6441 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Polinomio de Hermite  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **x** | **f(x)** | **1** | **2** | **3** | **4** | | 0 | -0,5 |  |  |  |  | |  |  | 1 |  |  |  | | 0 | -0,5 |  | -0,1 |  |  | |  |  | 0,9 |  | 0,1 |  | | 1 | 0,4 |  | 0 |  | 0 | |  |  | 0,9 |  | 0,1 |  | | 1 | 0,4 |  | 0,2 |  | 0 | |  |  | 1,1 |  | 0,1 |  | | 2 | 1,5 |  | 0,3 |  | 0 | |  |  | 1,4 |  | 0,1 |  | | 2 | 1,5 |  | 0,5 |  | 0 | |  |  | 1,9 |  | 0,1 |  | | 3 | 3,4 |  | 0,6 |  |  | |  |  | 2,5 |  |  |  | | 3 | 3,4 |  |  |  |  | | |  |  |  | | --- | --- | --- | | P(x) | 1,25 | 2,1 | |  | 0,6328125 | 1,6441 |   Mejora?  No mejora, el numero queda igual ya que su error relativo es 0 tanto para newton como para hermite |

# Ejercicio #3

Superficie

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Posición | Superfície | 1 | 2 | 3 | 4 | 5 |
| -30 | -11,1 |  |  |  |  |  |
|  |  | 0,20625 |  |  |  |  |
| -22 | -9,45 |  | -1,56250E-04 |  |  |  |
|  |  | 0,20375 |  | -1,04823E-04 |  |  |
| -14 | -7,82 |  | -5,39741E-03 |  | 3,18519E-06 |  |
|  |  | -0,02294117647 |  | 8,62881E-05 |  | -4,76324E-08 |
| 20 | -8,6 |  | -9,10428E-04 |  | -1,49083E-07 |  |
|  |  | -0,063 |  | 7,70450E-05 |  |  |
| 30 | -9,23 |  | 3,25000E-03 |  |  |  |
|  |  | 0,002 |  |  |  |  |
| 40 | -9,21 |  |  |  |  |  |

Nivel 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Posición | Nivel 1 | 1 | 2 | 3 | 4 |
| -30 | -15,23 |  |  |  |  |
|  |  | 0,5125 |  |  |  |
| -22 | -11,13 |  | -0,019375 |  |  |
|  |  | 0,2025 |  | 0,0002742647059 |  |
| -14 | -9,51 |  | -0,005661764706 |  | -0,0000030383587 |
|  |  | -0,03529411765 |  | 0,00009196318387 |  |
| 20 | -10,71 |  | -0,0008796791444 |  |  |
|  |  | -0,074 |  |  |  |
| 30 | -11,45 |  |  |  |  |

Nivel 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Posición | Nivel 2 | 1 | 2 | 3 | 4 |
| -30 | -18,02 |  |  |  |  |
|  |  | 0,4925 |  |  |  |
| -22 | -14,08 |  | -0,008807142857 |  |  |
|  |  | 0,05214285714 |  | 0,00008744505495 |  |
| 20 | -11,89 |  | -0,00356043956 |  | 0,000001276231833 |
|  |  | -0,133 |  | 0,0001767812832 |  |
| 30 | -13,22 |  | 0,0074 |  |  |
|  |  | 0,015 |  |  |  |
| 40 | -13,07 |  |  |  |  |

Caliza

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Posición | Caliza | 1 | 2 | 3 | 4 | 5 |
| -30 | -27,16 |  |  |  |  |  |
|  |  | 1,28125 |  |  |  |  |
| -22 | -16,91 |  | -0,051015625 |  |  |  |
|  |  | 0,465 |  | 8,02946E-04 |  |  |
| -14 | -13,19 |  | -0,01086834734 |  | -1,10538E-05 |  |
|  |  | 0,008529411765 |  | 1,39719E-04 |  | 1,60292E-07 |
| 20 | -12,9 |  | -0,003602941176 |  | 1,66695E-07 |  |
|  |  | -0,15 |  | 1,50054E-04 |  |  |
| 30 | -14,4 |  | 0,0045 |  |  |  |
|  |  | -0,06 |  |  |  |  |
| 40 | -15 |  |  |  |  |  |

Resultados:

|  |  |
| --- | --- |
| Superficie | -6.84 |
| Nivel 1 | -9,54680543 |
| Nivel 2 | -9,706601205 |
| Caliza | -12,04 |

## a)

Se encontrará a -6.84 metros

## b)

Se encontrará a -12.04 metros