1.

Par de valores: 0 y 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| regula falsi | |  |  |  |  |
| x0 | f(x0) | x1 | f(x1) | x2 | f(x2) |
| 0 | 1 | 4 | -25.4018 | 0.1515 | 1.048815 |
| 0.151505 | 1.048815 | 4 | -25.4018 | 0.3041 | 0.893014 |
| 0.304104 | 0.893014 | 4 | -25.4018 | 0.42962 | 0.6138 |
| 0.429622 | 0.6138 | 4 | -25.4018 | 0.51386 | 0.351471 |
| 0.51386 | 0.351471 | 4 | -25.4018 | 0.56144 | 0.177131 |
| 0.561438 | 0.177131 | 4 | -25.4018 | 0.58525 | 0.082856 |
| 0.585249 | 0.082856 | 4 | -25.4018 | 0.59635 | 0.037309 |
| 0.596351 | 0.037309 | 4 | -25.4018 | 0.60134 | 0.016501 |
| 0.601343 | 0.016501 | 4 | -25.4018 | 0.60355 | 0.007239 |
| 0.603549 | 0.007239 | 4 | -25.4018 | **0.60452** | 0.003164 |

|  |  |  |
| --- | --- | --- |
| secante |  |  |
|  | x | f(x) |
| x0 | 0 | 1 |
| x1 | 1 | -2.28172 |
| x2 | 0.304718 | 0.891976 |
| x3 | 0.500129 | 0.398287 |
| x4 | 0.657779 | -0.23287 |
| x5 | 0.599614 | 0.023732 |
| x6 | 0.604993 | 0.001156 |
| x7 | 0.605269 | -6.4E-06 |
| x8 | 0.605267 | 1.69E-09 |
| x9 | 0.605267 | 2.44E-15 |
| x10 | **0.605267** | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| f(x) = e^x-5x^2 | |  |  |
| newton rhapson | |  |  |
|  | x | f(x) | f'(x) |
| x0 | 1 | -2.28172 | -7.28172 |
| x1 | 0.686651 | -0.3704 | -4.87946 |
| x2 | 0.610741 | -0.02323 | -4.26562 |
| x3 | 0.605296 | -0.00012 | -4.22116 |
| x4 | 0.605267 | -3.4E-09 | -4.22093 |
| x5 | **0.605267** | 0 | -4.22093 |

3.

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

//secante, regula falsi, newton rhapson

namespace ConsoleApplication2

{

class Program

{

static double F1(double t)

{

double ret = 0;

ret += -3.141592 \* t \* Math.Exp(2.1667 \* t);

ret += (t \* t) - t + 3 - Math.Sin(t);

return ret;

}

static double F(double t, int s)

{

switch (s)

{

case 1:

return F1(t);

default:

return F1(t);

}

}

static double d(double t, int s)

{

double h = 0.000001;

double der = (F(t - 2 \* h, s) - 8 \* F(t - h, s) + 8 \* F(t + h, s) - F(t + 2 \* h, s)) / (12 \* h);

return der;

}

static double Falsi(double aa, double bb, int s)

{

double a = aa;

double b = bb;

double c;

double lim = 0.000000000001;

do

{

c = ((F(b,s) \* a - F(a,s) \* b) / (F(b,s) - F(a,s)));

if (F(c,s) \* F(a,s) < 0)

{

b = c;

}

else if (F(c,s) \* F(a,s) > 0)

{

a = c;

}

else

{

break;

}

}

while (Math.Abs(F(c,s)) > lim);

Console.WriteLine("Regula Falsi Root: " + c);

Console.ReadLine();

return c;

}

static double NR(double t,int s)

{

double t1;

do

{

t1 = t;

t = t - F(t, s) / d(t, s);

} while (Math.Abs(t - t1) > 0.000000000001);

Console.WriteLine("Newton Rhapson Root: " + t);

Console.ReadLine();

return t;

}

static double Sec(double x0, double x1, int s)

{

double x2 = x1;

while(true)

{

x2 = x1 - F(x1,s)\*((x1-x0)/(F(x1,s)-F(x0,s)));

if (Math.Abs(F(x2, s)) < 0.000000000001)

break;

x0 = x1;

x1 = x2;

}

Console.WriteLine("Secant Method Root: " + x2);

Console.ReadLine();

return x2;

}

static void Main(string[] args)

{

Sec(0, 1, 1);

Falsi(0, 1, 1);

NR(1, 1);

}

}

}