

%%Comparamos Método Bisección y Método de Regula Falsi: observamos
%%que el método de la Regula Falsi nos da %%mejores aproximaciones en
%% las primeras iteraciones

```
>> f=inline('x^2-exp(-x)') %Función que iteramos en [-1,1]
```

```
f =
```

```
Inline function:  
f(x) = x^2-exp(-x)
```

```
>> f(0)
```

```
ans =
```

```
-1
```

```
>> format long %Representación con más decimales
```

```
>> f(1)
```

```
ans =
```

```
0.632120558828558
```

```
>> regula_falsi(f,0,1,30)
```

```
Método de la regula falsi
```

```
n= 1, c= 0.612700, f(c)= -1.664848e-001  
n= 2, c= 0.693440, f(c)= -1.899443e-002  
n= 3, c= 0.702383, f(c)= -2.061294e-003  
n= 4, c= 0.703350, f(c)= -2.224606e-004  
n= 5, c= 0.703455, f(c)= -2.399422e-005  
n= 6, c= 0.703466, f(c)= -2.587810e-006  
n= 7, c= 0.703467, f(c)= -2.790968e-007  
n= 8, c= 0.703467, f(c)= -3.010074e-008  
n= 9, c= 0.703467, f(c)= -3.246381e-009  
n= 10, c= 0.703467, f(c)= -3.501238e-010  
n= 11, c= 0.703467, f(c)= -3.776107e-011  
n= 12, c= 0.703467, f(c)= -4.072465e-012  
n= 13, c= 0.703467, f(c)= -4.391487e-013  
n= 14, c= 0.703467, f(c)= -4.723999e-014  
n= 15, c= 0.703467, f(c)= -4.996004e-015  
n= 16, c= 0.703467, f(c)= -5.551115e-016  
n= 17, c= 0.703467, f(c)= -1.665335e-016  
n= 18, c= 0.703467, f(c)= 0.000000e+000  
n= 19, c= 0.703467, f(c)= 0.000000e+000  
n= 20, c= 0.703467, f(c)= 0.000000e+000  
n= 21, c= 0.703467, f(c)= 0.000000e+000  
n= 22, c= 0.703467, f(c)= 0.000000e+000  
n= 23, c= 0.703467, f(c)= 0.000000e+000  
n= 24, c= 0.703467, f(c)= 0.000000e+000  
n= 25, c= 0.703467, f(c)= 0.000000e+000  
n= 26, c= 0.703467, f(c)= 0.000000e+000  
n= 27, c= 0.703467, f(c)= 0.000000e+000  
n= 28, c= 0.703467, f(c)= 0.000000e+000  
n= 29, c= 0.703467, f(c)= 0.000000e+000  
n= 30, c= 0.703467, f(c)= 0.000000e+000
```

x =

0.703467422498392

ans =

0.703467422498392

>> biseccion(f,0,1,0.0001)

Método de la bisección

n=1

c=0.5

f(c)=-0.35653

n=2

c=0.75

f(c)=0.090133

n=3

c=0.625

f(c)=-0.14464

n=4

c=0.6875

f(c)=-0.030175

n=5

c=0.71875

f(c)=0.02924

n=6

c=0.70313

f(c)=-0.00065113

n=7

c=0.71094

f(c)=0.014249

n=8

c=0.70703

f(c)=0.0067873

n=9

c=0.70508

f(c)=0.0030652

n=10

c=0.7041

f(c)=0.0012063

n=11

c=0.70361

f(c)=0.00027741

n=12

c=0.70337

f(c)=-0.00018691

n=13

c=0.70349

f(c)=4.5241e-005

x =

0.703491210937500

ans =

0.70349121093750

%%Problema 7 de la Hoja 2.

```
>> g=inline('atan(4-x)')
```

```
g =
```

```
    Inline function:  
    g(x) = atan(4-x)
```

```
>> g(3.5)
```

```
ans =
```

```
    0.463647609000806
```

```
>> g=inline('atan(4-x)+pi')
```

```
g =
```

```
    Inline function:  
    g(x) = atan(4-x)+pi
```

```
>> g(3.5) %arco tangente está en [-pi,pi]: hay que + pi
```

```
ans =
```

```
    3.605240262590599
```

```
>> g(4)
```

```
ans =
```

```
    3.141592653589793
```

```
>> g(3.3)
```

```
ans =
```

```
    3.752318617979002
```

```
>> g(3.76)
```

```
ans =
```

```
    3.377137634310657
```

```
>> g(3.75)
```

```
ans =
```

```
    3.386571316716657
```

```
>> g(3.77)
```

```
ans =
```

```
    3.367661041583677
```

```
>> pfijo_error(g,3.5,3.3,3.77,0.0001,0.92)
```

```
n =
```

```
133
```

```
p =
```

```
Columns 1 through 6
```

```
3.5000000000000000 3.605240262590599 3.517573416065450  
3.591082952088986 3.529762426739592 3.581148111708802
```

```
Columns 7 through 12
```

```
3.538244291704620 3.574179510462526 3.544158057738097  
3.569294108172809 3.548286298845670 3.565870780721458
```

```
Columns 13 through 18
```

```
3.551170350940530 3.563472888768284 3.553186214926693  
3.561793763879841 3.554595716663108 3.560618212527904
```

```
Columns 19 through 24
```

```
3.555581470708737 3.559795342472147 3.556270977644202  
3.559219410252634 3.556753319298391 3.558816344222275
```

```
Columns 25 through 30
```

```
3.557090764054225 3.558534274794955 3.557326851352316  
3.558336887957893 3.557492031505645 3.558198764342748
```

```
Columns 31 through 36
```

```
3.557607603807885 3.558102112762946 3.557688468157080  
3.558034482067654 3.557745048505037 3.557987158829631
```

```
Columns 37 through 42
```

```
3.557784637798925 3.557954045561611 3.557812338606475  
3.557930875481892 3.557831721065514 3.557914662924147
```

```
Columns 43 through 48
```

```
3.557845283153508 3.557903318707532 3.557854772692329  
3.557895380969492 3.557861412633958 3.557889826807940
```

```
Columns 49 through 54
```

```
3.557866058683539 3.557885940475936 3.557869309584322  
3.557883221151393 3.557871584282593 3.557881318400157
```

```
Columns 55 through 60
```

```
3.557873175919589 3.557879987017605 3.557874289609677  
3.557879055430165 3.557875068873930 3.557878403585180
```

```
Columns 61 through 66
```

3.557875614135895 3.557877947480013 3.557875995663257
3.557877628336791 3.557876262623260 3.557877405027785

Columns 67 through 72

3.557876449418895 3.557877248775335 3.557876580122409
3.557877139443301 3.5578766671577483 3.557877062942143

Columns 73 through 78

3.557876735569878 3.557877009413210 3.557876780346251
3.557876971958266 3.557876811676906 3.557876945750516

Columns 79 through 84

3.557876833599404 3.557876927412586 3.557876848938883
3.557876914581280 3.557876859672131 3.557876905603036

Columns 85 through 90

3.557876867182335 3.557876899320832 3.557876872437329
3.557876894925086 3.557876876114323 3.557876891849321

Columns 91 through 96

3.557876878687167 3.557876889697166 3.557876880487422
3.557876888191272 3.557876881747085 3.557876887137577

Columns 97 through 102

3.557876882628490 3.557876886400292 3.557876883245220
3.557876885884403 3.557876883676756 3.557876885523429

Columns 103 through 108

3.557876883978707 3.557876885270850 3.557876884189986
3.557876885094117 3.557876884337822 3.557876884970454

Columns 109 through 114

3.557876884441265 3.557876884883926 3.557876884513644
3.557876884823381 3.557876884564290 3.557876884781016

Columns 115 through 120

3.557876884599727 3.557876884751373 3.557876884624523
3.557876884730632 3.557876884641873 3.557876884716119

Columns 121 through 126

3.557876884654013 3.557876884705964 3.557876884662508
3.557876884698858 3.557876884668451 3.557876884693886

Columns 127 through 132

3.557876884672610 3.557876884690407 3.557876884675520
3.557876884687973 3.557876884677556 3.557876884686270

Column 133

3.557876884678981

ans =

133

%%Problema propuesto: Newton-Raphson a $\exp(x) \cdot \log x + x^3 - 2$, $x > 0$

>> f=inline('exp(x)*log(x)+x^3-2')

f =

Inline function:
f(x) = exp(x)*log(x)+x^3-2

>> f(1)

ans =

-1

>> f(2)

ans =

11.121703401973049

>> f(1.5)

ans =

3.192168543411802

>> f(1.3)

ans =

1.159692321312939

>> g=inline('x- (exp(x)*log(x)+x^3-2)/(exp(x)*log(x)+exp(x)/x+3*x^2)')

g =

Inline function:
g(x) = x- (exp(x)*log(x)+x^3-2)/(exp(x)*log(x)+exp(x)/x+3*x^2)

>> g(1)

ans =

1.174877704527110

>> g(1.5)

ans =

```
1.223740437339318
>> g(1.3)
ans =
1.169038686234918
>> pfijo_error(g,1.2,1,1.3,0.001,0.44)
n =
9
p =
Columns 1 through 6
1.2000000000000000 1.156666035291672 1.155254372916031
1.155252919378268 1.155252919376729 1.155252919376729
Columns 7 through 9
1.155252919376729 1.155252919376729 1.155252919376729
ans =
9
```