Practica 1

1. Taylor orden 4 alrededor de 0

$$f(x) = \frac{e^x - e^{-x}}{2}$$

$f(x) = \frac{e^x - e^{-x}}{2}$ $\quad f(0) = 0$

$f'(x) = \frac{e^x + e^{-x}}{2}$ $\quad f'(0) = 1$

$f''(x) = \frac{e^x - e^{-x}}{2}$ $\quad f''(0) = 0$

$f'''(x) = \frac{e^x + e^{-x}}{2}$ $\quad f'''(0) = 1$

$f^{IV}(x) = \frac{e^x - e^{-x}}{2}$ $\quad f^{IV}(0) = 0$

$$a)(x) = x + \frac{x^3}{6}$$

2. A binario

a) 73_{10} =

÷	%
36	1
18	0
9	0
4	1
2	0
1	0
0	1

$= 1001001_2$

b) 131_{10}

÷	%
65	1
32	1
16	0
8	0
4	0
2	0
1	0
0	1

$= 10000011_2$

c) $0.25_{10} = 0.01000000000_2$

x
0.5
1.0
0.0
0 0
0 0
0 0
0 0
0 0
0 0
0 0

c) $1.312_b = 1.0100111111_2$

x
0.624
1.248
0.496
0.992
1.984
1.968
1.936
1.872
1.744
1.488

3. Realiza

a)
```
  10111101
+ 01110111
 100110100
```

b)
```
  11010
- 01001
  10001
```

c)
```
    11010
  ×   110
    00000
   11010
  11010
 10011100
```

d)
```
11110111101 | 101
101           11000
 0011
```

4. C_2, 8 bits.

a) 17 + 10:
```
  00010001
+ 00001010
  00011011
```
27

b) 17 − 10
= 17 + (−10)

$10C_2$ = 11110110
```
  00010001
+ 11110110
 100000111
```
7

c) −17 − 10 =

$17C_2$ = 11101111
$10C_2$ = 11110110
```
  11101111
+ 11110110
 111100101
```
C_2 → 100011011 = −27

5. Considera $f(x) = 2x^2 - 1$

a) Bisección [0, 1]

0.7

b) Raphson (número arbitrario en intervalo [0, 1])

0.7

Aproximaciones

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Function

In [132]:
```
expression = "2*x**2-1"
```

Method

In [131]:
```
NewtonRaphson(0.5, 0.00001, 500)
```

```
        f(x) = 2*x**2 - 1
        f'(x) = 4*x

1. P = 0.750000000000000        Er = 0.333333333333333
2. P = 0.708333333333333        Er = 0.0588235294117646
3. P = 0.707107843137255        Er = 0.00173310225303292
4. P = 0.707106781187345        Er = 1.50182396529309e-6
```

Out[131]: 0.707106781187345

In [130]:
```
BinarySearch(0, 1, 0.00001, 500)
```

```
        f(x) = 2*x**2 - 1
        [0, 1]

1. P = 0.5      Er = 1.0
2. P = 0.75     Er = 0.3333333333333333
3. P = 0.625    Er = 0.2
4. P = 0.6875   Er = 0.09090909090909091
5. P = 0.71875  Er = 0.043478260869565216
6. P = 0.703125 Er = 0.022222222222222223
7. P = 0.7109375        Er = 0.01098901098901099
8. P = 0.70703125       Er = 0.005524861878453038
9. P = 0.708984375      Er = 0.002754820936639118
10. P = 0.7080078125    Er = 0.001379310344827586
11. P = 0.70751953125   Er = 0.0006901311249137336
12. P = 0.707275390625  Er = 0.00034518467380048324
13. P = 0.7071533203125 Er = 0.00017262213015708613
14. P = 0.70709228515625        Er = 8.631851532153647e-05
15. P = 0.707122802734375       Er = 4.3157395019636617e-05
16. P = 0.7071075439453125      Er = 2.1579163160052653e-05
17. P = 0.7070999145507812      Er = 1.0789697996353082e-05
18. P = 0.7071037292480469      Er = 5.394819893937841e-06
```

Out[130]: 0.7071037292480469