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Parcial 1 Análisis Numérico

3 c. Teorema de Taylor:

f(x) = ln(1 + x) en [−0.5, 0.5] para x = 0.005, 0.0001, 0.499999999

```
import numpy as np
import sympy as sym
import math
import matplotlib.pyplot as plt

x  = sym.Symbol('x')
e =2.7182818284590
fun = math.log(e,x+1)
fx = sym.cos(x)
muestras = 51
x0 = -5
grado = 2
n  = grado + 1
while (x0 < 5):
    k = 0
    polinomio = 0
    while (k < n):
        derivada   = fx.diff(x,k)
        derivadax0 = derivada.subs(x,x0)
        divisor    = np.math.factorial(k)
        terminok   = (derivadax0/divisor)*(x-x0)**k
        polinomio = polinomio + terminok
        k = k + 1
        plt.plot(k, x0)
    x0 = x0 + 1
print(polinomio)
```

```
In [26]: runfile('C:/Users/julia/.spyder-py3/temp.py', wdir='C:/Users/julia/.spyder-py3')
-(x - 4)**2*cos(4)/2 - (x - 4)*sin(4) + cos(4)

In [27]: runfile('C:/Users/julia/.spyder-py3/temp.py', wdir='C:/Users/julia/.spyder-py3')
-(x - 4)**2*cos(4)/2 - (x - 4)*sin(4) + cos(4)
```