

In [1]:

```
from math import tanh , cosh,sqrt
from numpy import linspace
from pylab import plot, show, xlabel, ylabel
```

In [2]:

```
df_dx=[]
df_dx_2=[]
def f(x):
    return (1+((tanh(x*2))/2))
a=-2
b=2

C=10e-16
e1=0
e2=1
paso=6
while (e1<e2):
    e1=0
    e2=0
    h=(b-a)/paso
    puntos=linspace(a,b,paso)
    for x in puntos:
        l=(f(x+(h))-f(x-(h)))/(2*h)
        df_dx.append(l)
        e1=e1+sqrt(4*C*abs(f(x)*l))

        m=(f(x+(h))-f(x))/(h)
        df_dx_2.append(m)
        e2=e2+sqrt(4*C*abs(f(x)*m))
    if (e1>e2):
        paso=paso+1

print(e1)
print(e2)
print(h,paso)
```

```
1.3396639022931861e-07
1.1399001431440845e-07
0.6666666666666666 7
```

In []: