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In [1]: import numpy as np

x = 9.999999995000000e-10

f = lambda x : ( np.exp(x) -1)
g = lambda x : x + (x**2)/2
h = lambda x : x

trueAnswer = np.expm1(x)

correctDigits = lambda guess: -np.log10( abs( (guess - trueAnswer)/trueAnswer) + 1e-100 )

print("The number of correct digits via Direct computation is about %.1f"% correctDigits( f(x) ) )
print("The number of correct digits via Taylor series with 1 term is about %.1f"% correctDigits( h(x) ) )
print("The number of correct digits via Taylor series with 2 terms is about %.1f"% correctDigits( g(x) ) )

```

The number of correct digits via Direct computation is about 7.1
 The number of correct digits via Taylor series with 1 term is about 9.3
 The number of correct digits via Taylor series with 2 terms is about 100.0

In []: