

ANÁLISE NUMÉRICA - LAB 1

19/AGO

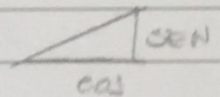
$$F(x) = \cos(x)$$

$$x_0 = \frac{\pi}{2}$$

$$f'(x) = -\text{SEN}(x)$$

$$f''(x) = -\cos(x)$$

$$f'''(x) = \text{SEN}(x)$$



$$f''''(x) = \cos(x)$$

$$f''''''(x) = -\text{SEN}(x)$$

SÉRIE DE TAYLOR DE ORDEM 4

$$f(x) = f(x_0) + \frac{f'(x_0)}{1!} (x-x_0) + \frac{f''(x_0)}{2!} (x-x_0)^2 + \frac{f'''(x_0)}{3!} (x-x_0)^3 +$$

$$\frac{f''''(x_0)}{4!} (x-x_0)^4$$

$$f(x) = \cancel{\cos(\frac{\pi}{2})} + \cancel{-\text{SEN}(\frac{\pi}{2})} (x-\frac{\pi}{2}) + \cancel{-\frac{\cos(\frac{\pi}{2})}{2}} (x-\frac{\pi}{2})^2 + \cancel{\frac{\text{SEN}(\frac{\pi}{2})}{6}} (x-\frac{\pi}{2})^3$$

$$+ \cancel{\frac{\cos(\frac{\pi}{2})}{24}} (x-\frac{\pi}{2})^4$$

$$f(x) = - (x-\frac{\pi}{2}) + \frac{(x-\frac{\pi}{2})^3}{6} = (x-\frac{\pi}{2}) \left(-1 + \frac{(x-\frac{\pi}{2})^2}{6} \right)$$

Erro:

$$f''''''(x) = -\text{SEN}(x) \text{ O MAIOR VALOR DE SEN É 1 ONDO}$$

$$x=0 //$$

Erro: $\left| \frac{-(x - \pi/2)^5}{5!} \right|$

2º QUESTÃO

REPRESENTAÇÃO BINÁRIA:

$$\begin{aligned}
 2.3 &\leadsto 2 + 0.3 \leadsto 0.3 \times 2 = 0.6 \\
 &0.6 \times 2 = 1.2 \\
 &0.2 \times 2 = 0.4 \\
 &0.4 \times 2 = 0.8 \\
 &0.8 \times 2 = 1.6 \\
 &0.6 \times 2 = 1.2
 \end{aligned}$$

01001

10.01001

DOUBLE 64 BITS
EXP 11 FRAC 52 SINAL

BIAS 1023

NORMALIZANDO: 1.001001×2^1

SINAL: 0

51: $1 + 50/5$
 $1 + 6.10$

EXP: $1 + 1023 = 1024 \leadsto 100000000000$

FRAC: 00100101001 (..) 010010

$2.0 \leadsto 10 \leadsto 1.0 \times 2^1$

SINAL: 0

EXP: $100000000000 \leadsto 1 + 1023 = 1024$

FRAC: 00 (...) 00

0.3

$$\begin{aligned}
 0.3 \times 2 &= 0.6 \\
 0.6 \times 2 &= 1.2 \\
 0.2 \times 2 &= 0.4 \\
 0.4 \times 2 &= 0.8 \\
 0.8 \times 2 &= 1.6
 \end{aligned}$$

0.01001

03 \leadsto 0.01001

NORMALIZANDO 1.00101001×2^{-2}

SINAL: 0

EXP: $1023 - 2 = 1021 \leadsto 01111111101$

FRAC: 00101001 (...) 0100

$52 - 3 = 49 = 5 \times 10^{-1}$

