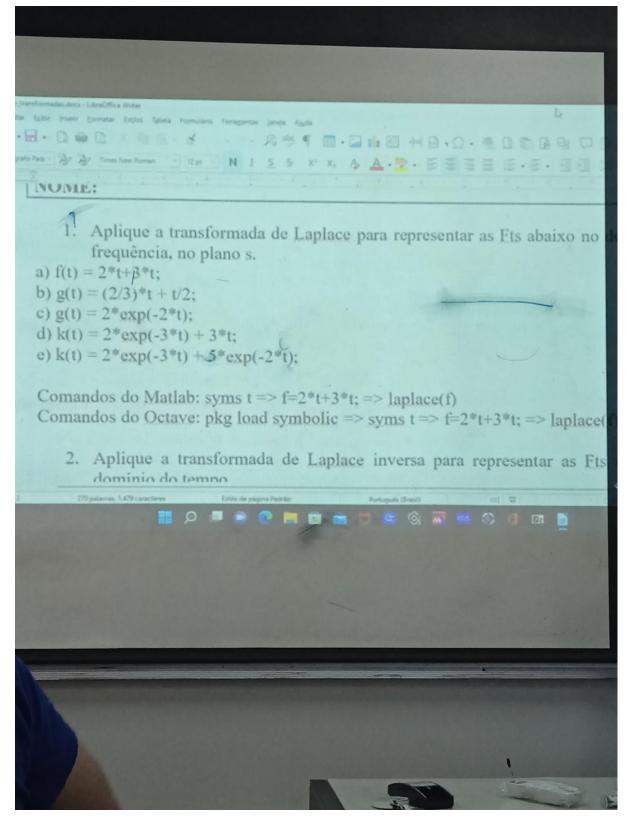Aula 08-09-2022 aula prática

Usando o Octave Online(Alternativa ao Matlab)
Prática
- Transformada de Laplace
- Transformada inversa de Laplace

- Transformada Z

NOME:

1. Aplique a transformada de Laplace para representar as Fts abaixo no d frequência, no plano s.

a) $f(t) = 2*t + \beta*t$;

b) $g(t) = (2/3)*t + t/2$;

c) $g(t) = 2*\exp(-2*t)$;

d) $k(t) = 2*\exp(-3*t) + 3*t$;

e) $k(t) = 2*\exp(-3*t) + 5*\exp(-2*t)$;

Comandos do Matlab: syms t => f=2*t+3*t; => laplace(f)

Comandos do Octave: pkg load symbolic => syms t => f=2*t+3*t; => laplace(

2. Aplique a transformada de Laplace inversa para representar as Fts dominio do tempo

$$g(t) = 2 \times e^{-2t}$$

$$f = 2t + 3t$$

$$f = 5 \cdot t$$

$$f(t) = 5 \times t$$

$$\boxed{f(s) = \frac{5}{s^2}}$$

$$g(t) = \frac{(2 \times t)}{3} + \frac{t}{2} \; ;$$

$$g(s) = \frac{2}{3} \cdot \frac{1}{s^2} + \frac{1}{2} \cdot \frac{1}{s^2}$$

$$g(s) = \frac{4 + 3}{6 \times s^2} \Rightarrow \boxed{g(s) = \frac{7}{6 \cdot s^2}}$$

Comandos do Octave: pkg load symbolic => syms t => f=2*t+3*t; => laplace(

2. Aplique a transformada de Laplace inversa para representar as Fts
domínio do tempo.

a) F(s) = 2/(s+4);
b) F(s) = 1/((s+1)*(s+2));
c) K(s) = 3/((s+2)*(s+3));
d) H(s) = 1/(s+1) + 3/(s+2);
e) G(s) = 2/s^2 + 3/s^3;
f) F(s) = 2/((s+1)*(s+2)*(s+3));

Comandos do Matlab: syms s => F = 2/(s+4); => ilaplace(F)
Comandos do Octave: pkg load symbolic => F = 2/(s+4); => ilaplace(F)

B) F(s

$\Rightarrow$ TRANSF. DE LAPLACE
$\Rightarrow$ TRANSF. INVERSA DE LAPLACE
$\Rightarrow$ TRANSFORMADA Z.

A =

B =

$$F(s) = \frac{2}{s+4} \Rightarrow f(t) = 2 \cdot e^{-4t}$$

F(s) =

c) $K(s) = \dfrac{3}{(s+2)\cdot(s+3)} = \dfrac{A}{s+2} + \dfrac{B}{s+3}$

$K(s) = \dfrac{3}{s+2} - \dfrac{3}{s+3}$

$A = \dfrac{3}{s+3}\Big|_{s=-2} \Rightarrow A = 3$

$B = \dfrac{3}{s+2}\Big|_{s=-3} \Rightarrow B = -3$

$k(t) = 3 \cdot e^{-2t} - 3 \cdot e^{-3t}$

$k(t) = 3 \cdot (e^{-2t} - e^{-3t})$

$$3) \quad F(s) = \frac{1}{(s+1)\cdot(s+2)} = \frac{A}{s+1} + \frac{B}{s+2}$$

$$A = \frac{1}{s+2}\bigg|_{s=-1} \Rightarrow A = 1$$

$$B = \frac{1}{s+1}\bigg|_{s=-2} \Rightarrow B = -1$$

$$F(s) = \frac{1}{s+1} - \frac{1}{s+2} \Rightarrow f(t) = e^{-t} - e^{-2t}$$

3t

t)

Comandos do Octave: pkg load symbolic => f = 2/(s+4); => laplace(f)

3. Aplique a transformada Z para representar as FTs abaixo no plano Z.
a) $F(s) = 3/(s+4)$;
b) $F(s) = 2/((s+3)*(s+2))$;
c) $K(s) = 3/((s+2)*(s+3))$;
d) $H(s) = 1/(s+1) + 3/(s+2)$;
e) $G(s) = 2/s^2 + 3/s^3$;
f) $F(s) = 2/(s^2 + 3s + 2)$;

Comandos do Matlab: syms s => f = tf([0 3],[1 4]) => fz = c2d(f,1,'zoh')
Comandos do Octave: pkg load control => syms s => f = tf([0 3],[1 4]) => fz = c2d(f,1,'zoh')

4. Aplique a transformada Z inversa para representar as FTs abaixo em tempo

OCTAVE

=> TRANSF. DE LAPLACE
=> TRANSF. INVERSA DE
=> TRANSFORMADA Z

AMOSTRADOR   SEGURADOR DE ORDEM
              ZERO (ZOH).