

Nome: Pedro Henrique Rodrigues Marques Dos Santos
Matricula: 11611ECP017

Prova 01

Q1)

MAT1: 11611ECP017, KANO1: 2, KCUR1: 3, KNUM1: 9

MAT2: 10011EEL034, KANO2: 4, KCUR2: 4, KNUM2: 8

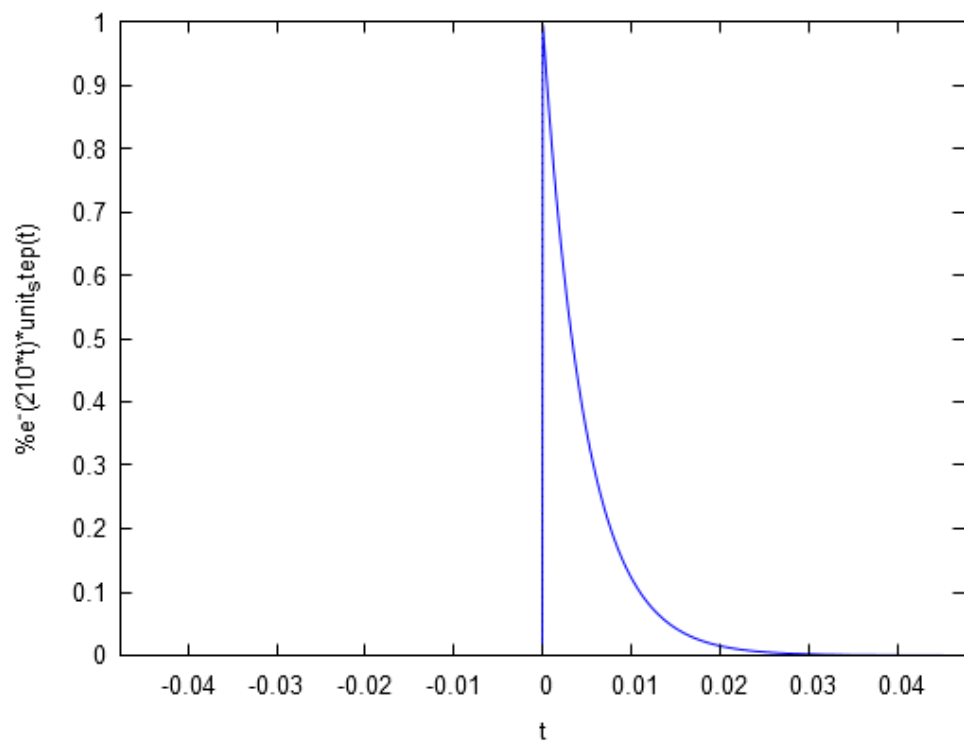
MAT3: 10021EBI075, KANO3: 5, KCUR3: 2, KNUM3: 4

Q2)

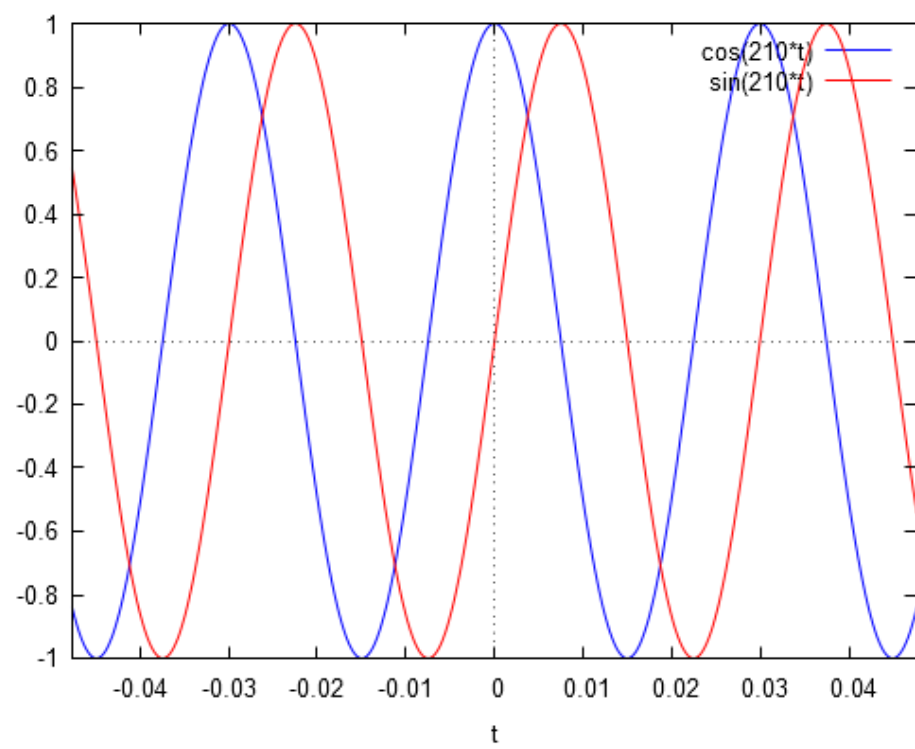
A)

$f_0 = 210$ [Hz].

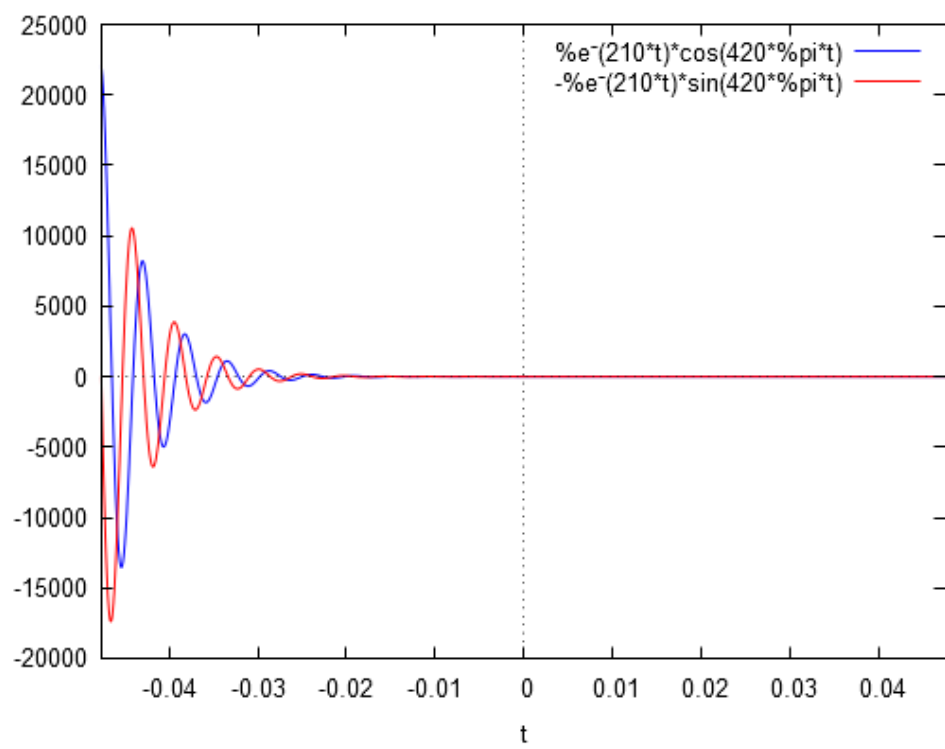
$Y_1 =$



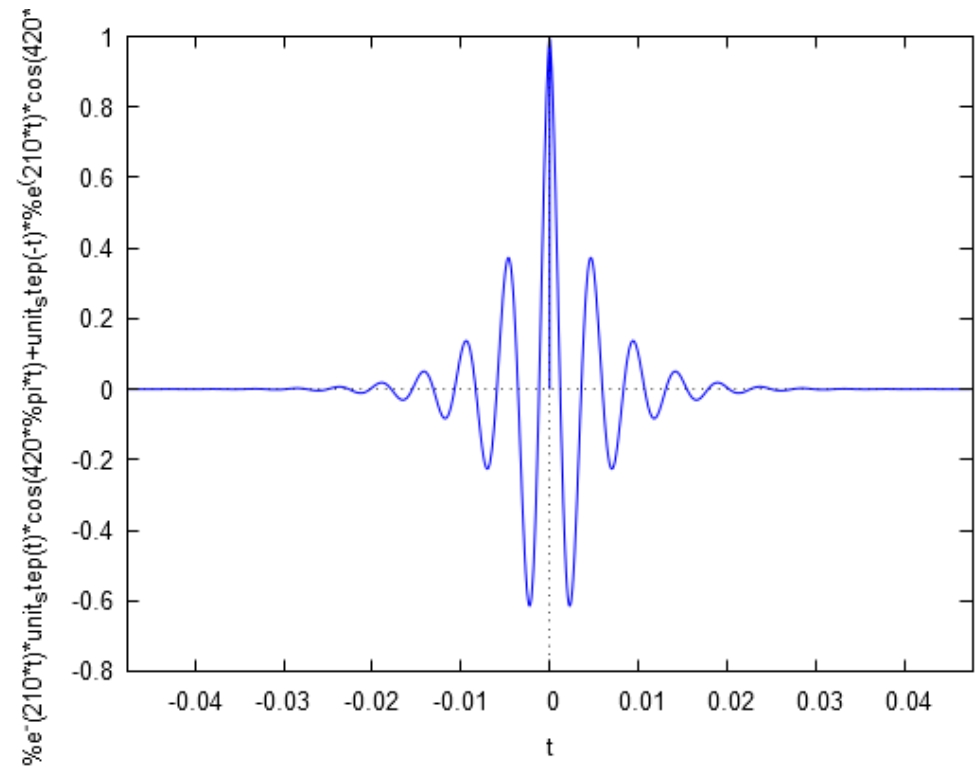
$Y_2 =$



$Y_3 =$

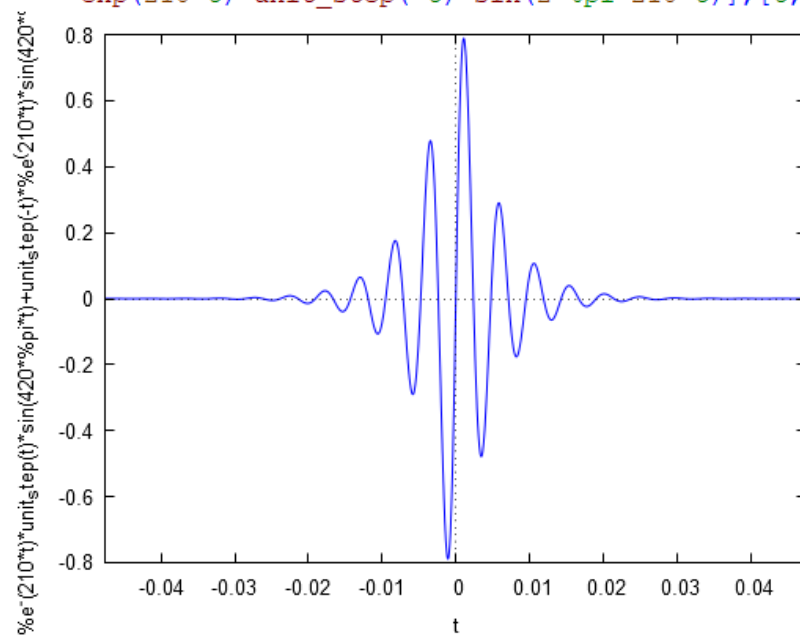


$Y_4 =$



B)

```
wxplot2d([exp(-210*t)*unit_step(t)*sin(2*pi*210*t)+
exp(210*t)*unit_step(-t)*sin(2*pi*210*t)], [t, -10/210, 10/210]);
```



Q3)

$$h(n) := 2 \delta(n-3) + 4 \delta(n-4) + 5 \delta(n-2)$$

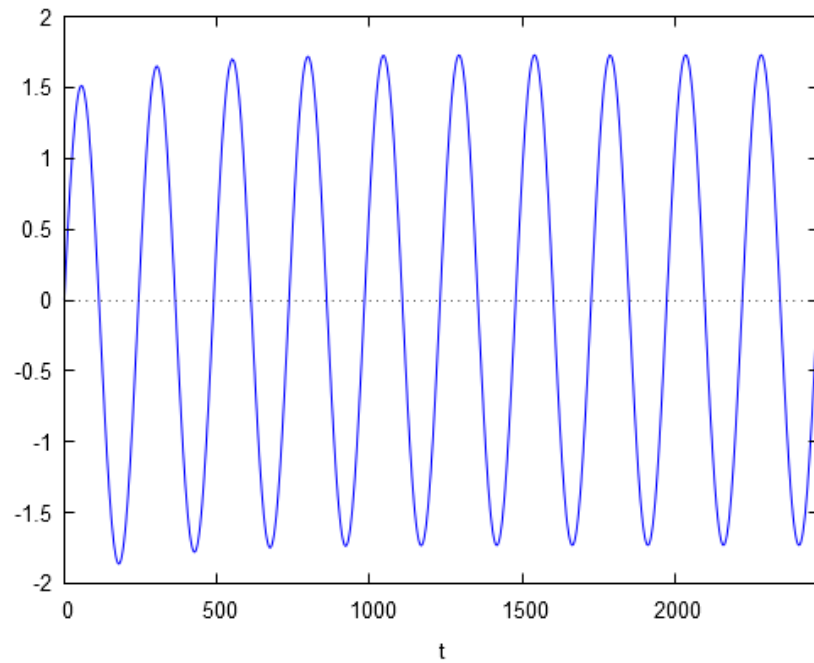
$$x(n) := 9 \delta(n-3) - 8 \delta(n-4) + 4 \delta(n-2) - \delta(n-2) + \delta(n-4) + \delta(n-5)$$

$$Y(n) = 11 n^3 - 151 n^2 + 320 n$$

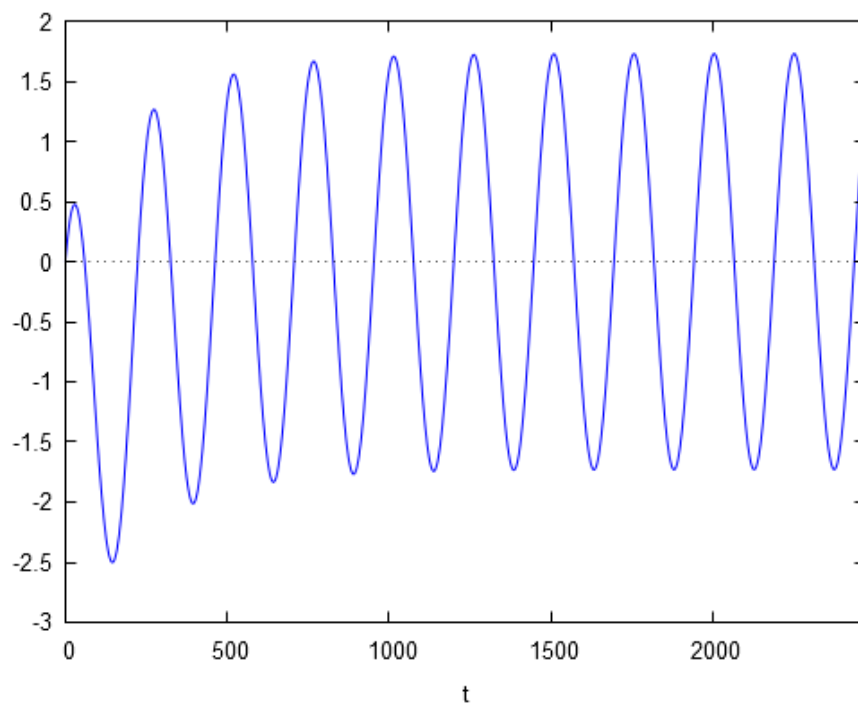
Q4)

Saída pela convolução:

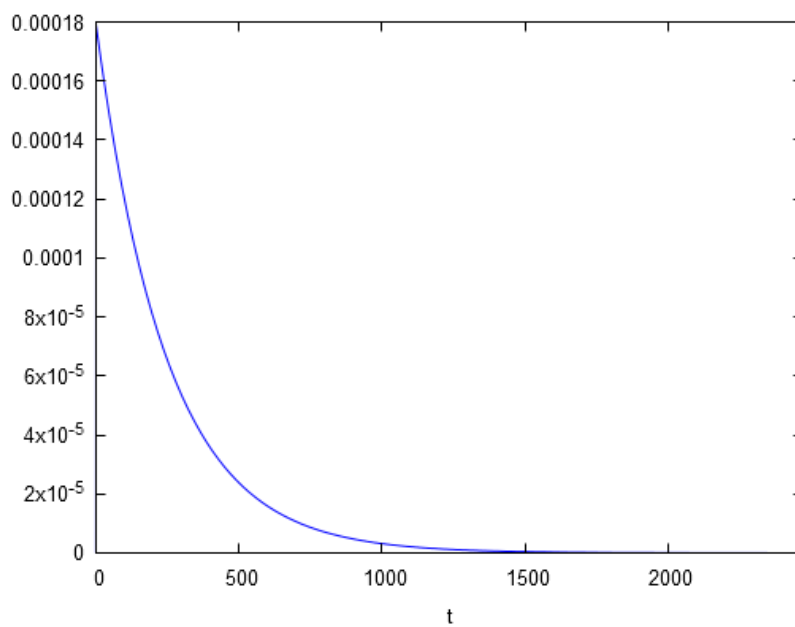
$$v_{in}(t) := A \cos(\omega t)$$



$$v2(t) := A \cos\left(\omega t + \frac{\pi}{4}\right)$$



$$v3(t) := A \exp\left(\frac{(-2)\pi}{\omega} t\right) \cos(\omega t)$$



Saída pelo modelo:

$$V_C(t) = \frac{e^{-\frac{2t}{495}} \left(22\pi e^{\frac{2t}{495}} \sin\left(\frac{4\pi t}{495}\right) + 11 e^{\frac{2t}{495}} \cos\left(\frac{4\pi t}{495}\right) - 11 \right)}{4\pi^2 + 1}$$

Figura A Para V1(t)

$$V_C(t) = \frac{e^{-\frac{2t}{495}} \left(\left(11 \cdot 2^{3/2} \pi - 11 \sqrt{2} \right) e^{\frac{2t}{495}} \sin\left(\frac{4\pi t}{495}\right) + \left(11 \cdot 2^{3/2} \pi + 11 \sqrt{2} \right) e^{\frac{2t}{495}} \cos\left(\frac{4\pi t}{495}\right) - 11 \cdot 2^{3/2} \pi - 11 \sqrt{2} \right)}{8\pi^2 + 2}$$

Figura B Para V2(t)

$$V_C(t) = \frac{e^{-\frac{245029t}{990}} \left(352\pi e^{\frac{2t}{495}} \sin\left(\frac{4\pi t}{495}\right) - 10780924 e^{\frac{2t}{495}} \cos\left(\frac{4\pi t}{495}\right) + 10780924 e^{\frac{495t}{2}} \right)}{64\pi^2 + 60035290441}$$

Figura C Para V3(t)