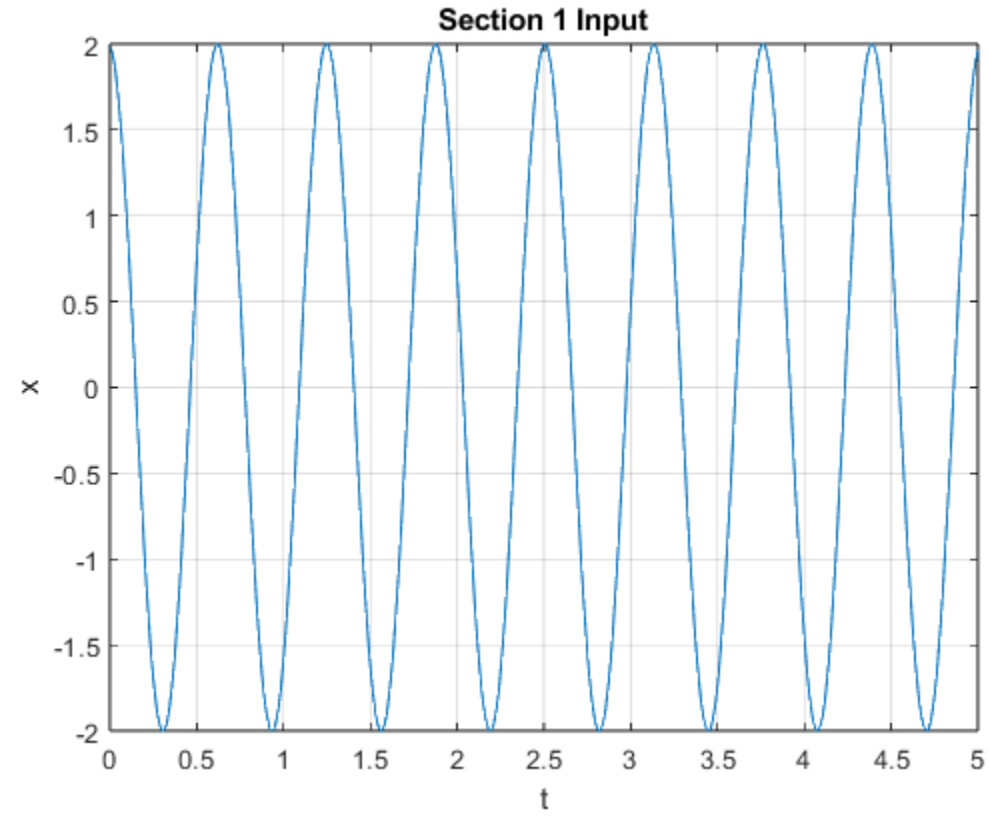
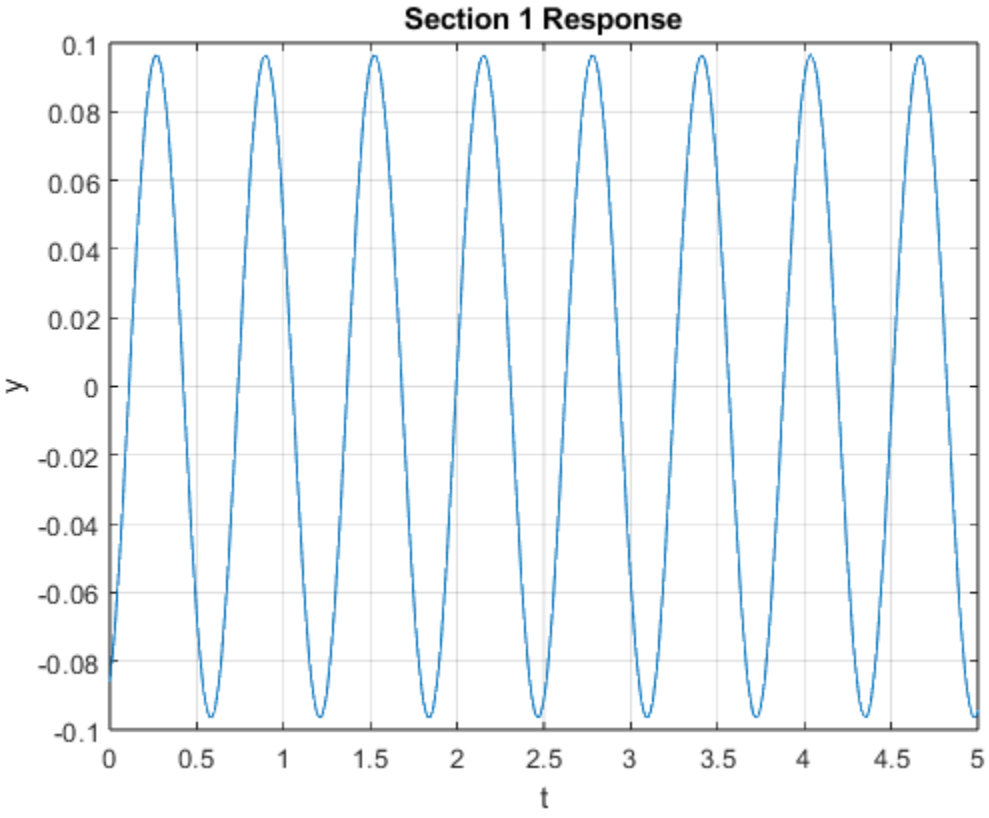
Jonathan Sumner

Lab 3 – System Response

EEET-332.01 – Signals, Systems, and Transformers Lab

Due Date: 09/29/2024


Section 1 Input
x
t
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


Section 1 Response
y
t
0.1
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
-0.1
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

Editor - C:\Users\impos\OneDrive - rit.edu\School\Year 5\Semester 1\EEET 332\Lab 3\forced_resp_solver.m

section2.m | section1.m | forced_resp_solver.m

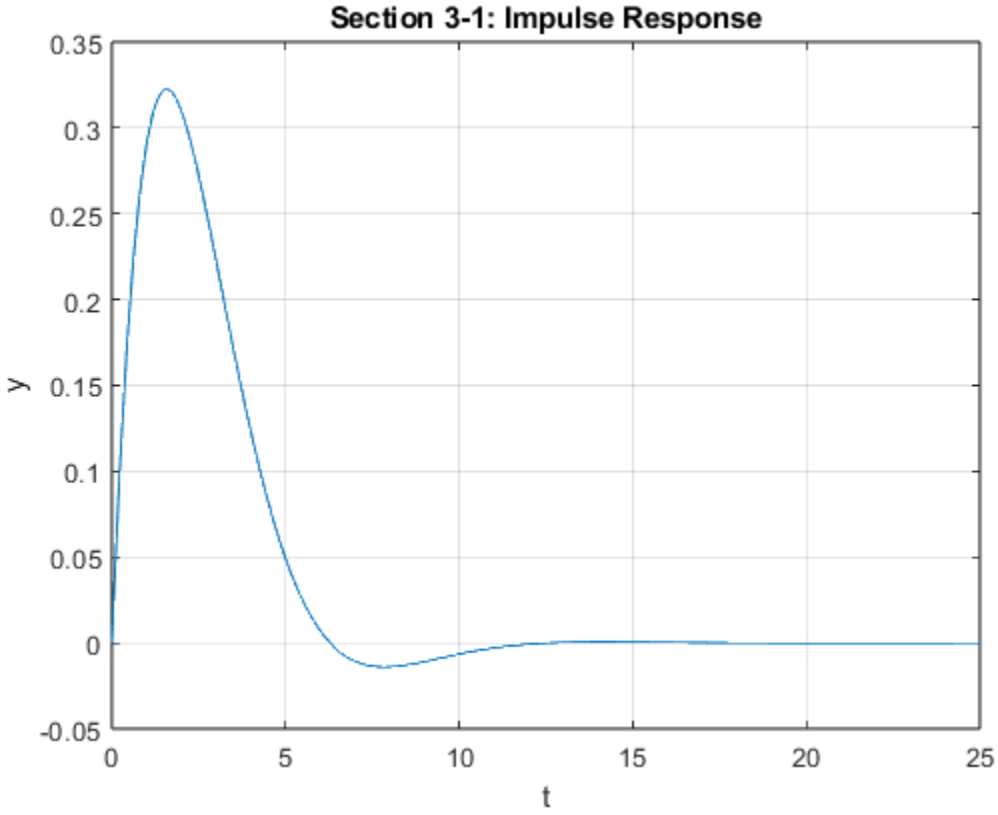
```
function [mag_y, theta_y]=forced_resp_solver (num,den,mag_x,theta_x,sigma,omega)
    s=sigma+(1j*omega);
    x=mag_x*exp(1j*theta_x);
    Y=(polyval(num,s)./polyval(den,s)).*x;
    mag_y=abs(Y); theta_y=angle(Y);
    disp(['Output vector Y= ' num2str(mag_y) 'e^(' num2str(theta_y) 'j)']);
end
```

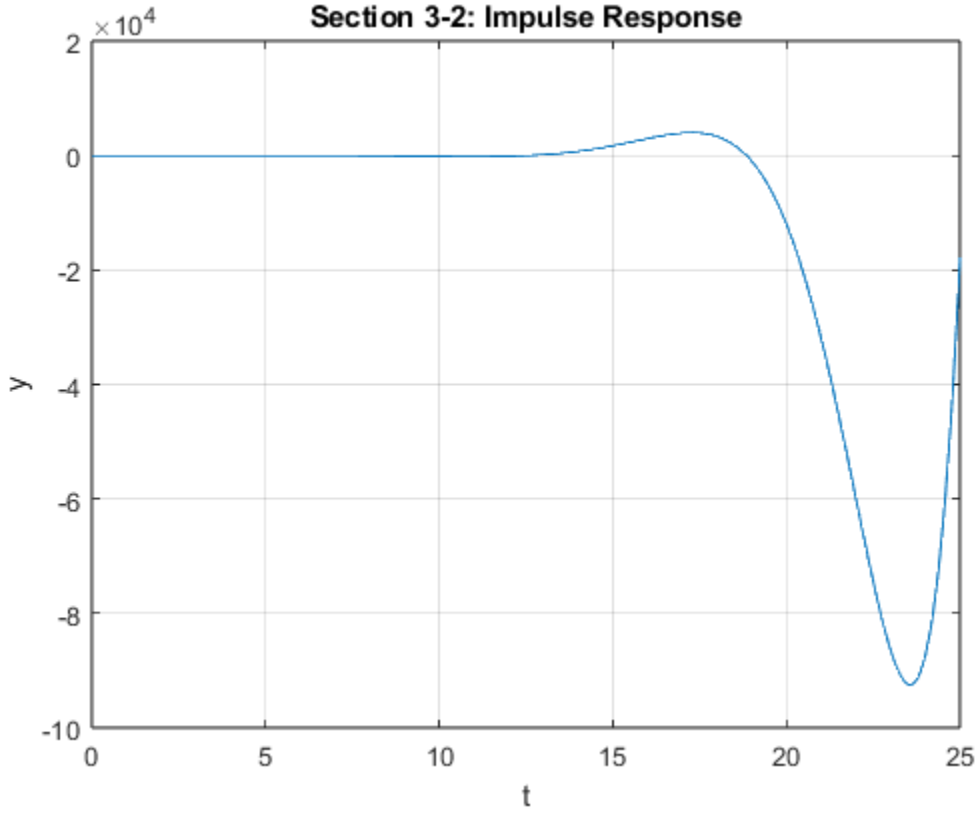
Editor - C:\Users\impos\OneDrive - rit.edu\School\Year 5\Semester 1\EEET 332\Lab 3\section1.m

section2.m | section1.m

```
init();
disp('Section 1 Example 1');
sigma = 0; omega = 10;
mag_x= 2; theta_x= 5*(pi/180);
t=linspace(0,5,1000);
x_t=mag_x*cos(omega*t+theta_x);
make_plot(t,x_t,'Section 1 Input','t','x');
num=[5 0]; den=[1 4 4 8];
[mag_y, theta_y]=forced_resp_solver(num,den,mag_x,theta_x,sigma,omega)
y_t=mag_y*cos(omega*t+theta_y);
make_plot(t,y_t,'Section 1 Response','t','y');

```


Section 3-1: Impulse Response
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
y
0
5
10
15
20
25
t


Section 3-2: Impulse Response
×10^4
2
0
-2
-4
-6
-8
-10
y
0
5
10
15
20
25
t

Section 4:

a) $x = 2$
   i. $\vec{X} = 2\angle 0°$
   ii. $s = 0$
   iii. $\vec{Y} = 1$

b) $x = 6\cos(3t + 30°)$
   i. $\vec{X} = 6\angle 30° = 6e^{0:52359878j}$
   ii. $s = 3j$
   iii. $\vec{Y} = 0.98361e^{1.1671j}$

$y(t) = 1 + 0.98361 * cos(3t + 66.86990427)$

Signals Systems and Transforms
EEET-332
Lab 3

Report:

Create your own cover page.

Submit your cover page, the screenshots from sections 1, and 3, the solution for section 4, and this sign-off sheet.

Sign-offs

Name Jonathan Sumner

Section 2: forced response

Signature	Date
	09/23/24

Section 3: Pole-zero diagrams

Signature	Date
	9/23/24