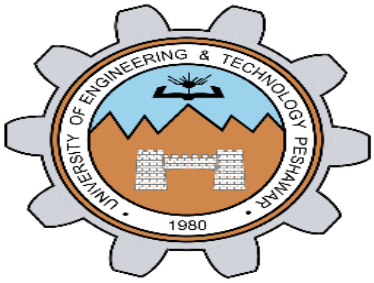
Lab report no 3



Fall 2022

Control System Lab

Submitted By

Name	Registration No
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Section: **A**

Date: 11,08,22

Submitted to: Dr Muniba Ashfaq

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Objectives: -

- To understand stable, unstable, marginally stable LTI system.
- To learn how to find stability of system.
- And to practice the following in Simulink also.

Task no 1: -

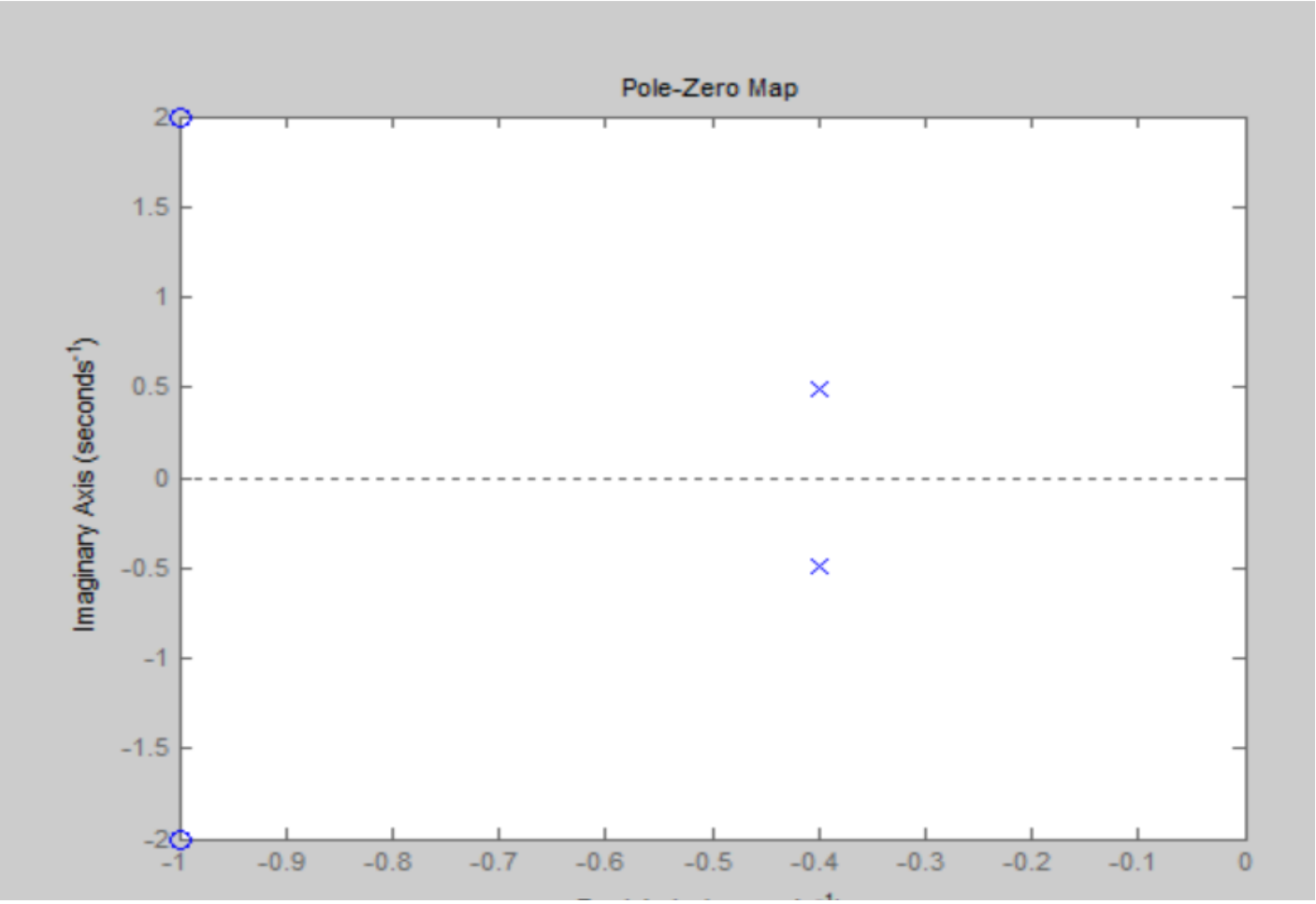
Stable LTI system, system which has pole in the left side of the plane.

Code: -

```
clc
clear all
close all

%initial values for d/f function

p=[1 2 5];

%unstable system den = [-1 2 1]; nom = [1 2 5];

den = [1 0 1];
nom = [1 2 4];

%stable system den = [5 4 2]; nom = [1 2 5];

%marginally stable system den = [1 0 1]; nom = [1 2 4];


%finding roots
r=roots(p);

%finding poly
p=poly(r);


%finding transfer function
transfer_fuc = tf(nom,den);
```

```
%finding pzmap
pzmap(transfer_fuc);


%finding step step(transfer_fuc);
```

Stable: -



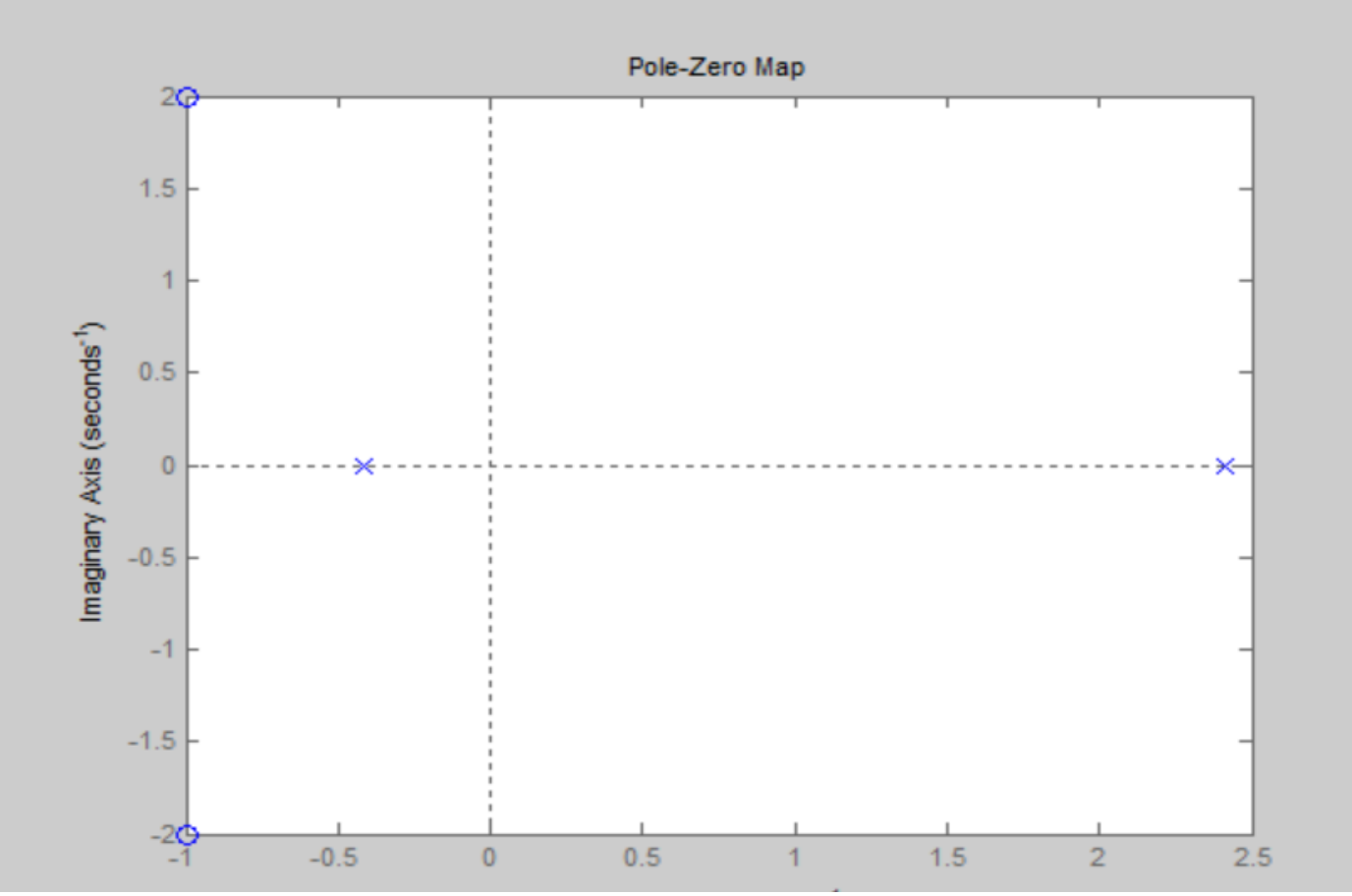
Task no 2: -

Unstable LTI system, the system which has at least one pole in the right side of the plane.

Code: -

```
den = [-1 2 1];
nom = [1 2 5];
r=roots(p);

p=poly(r);
transfer_fuc = tf(nom,den);
pzmap(transfer_fuc);
```

Unstable: -



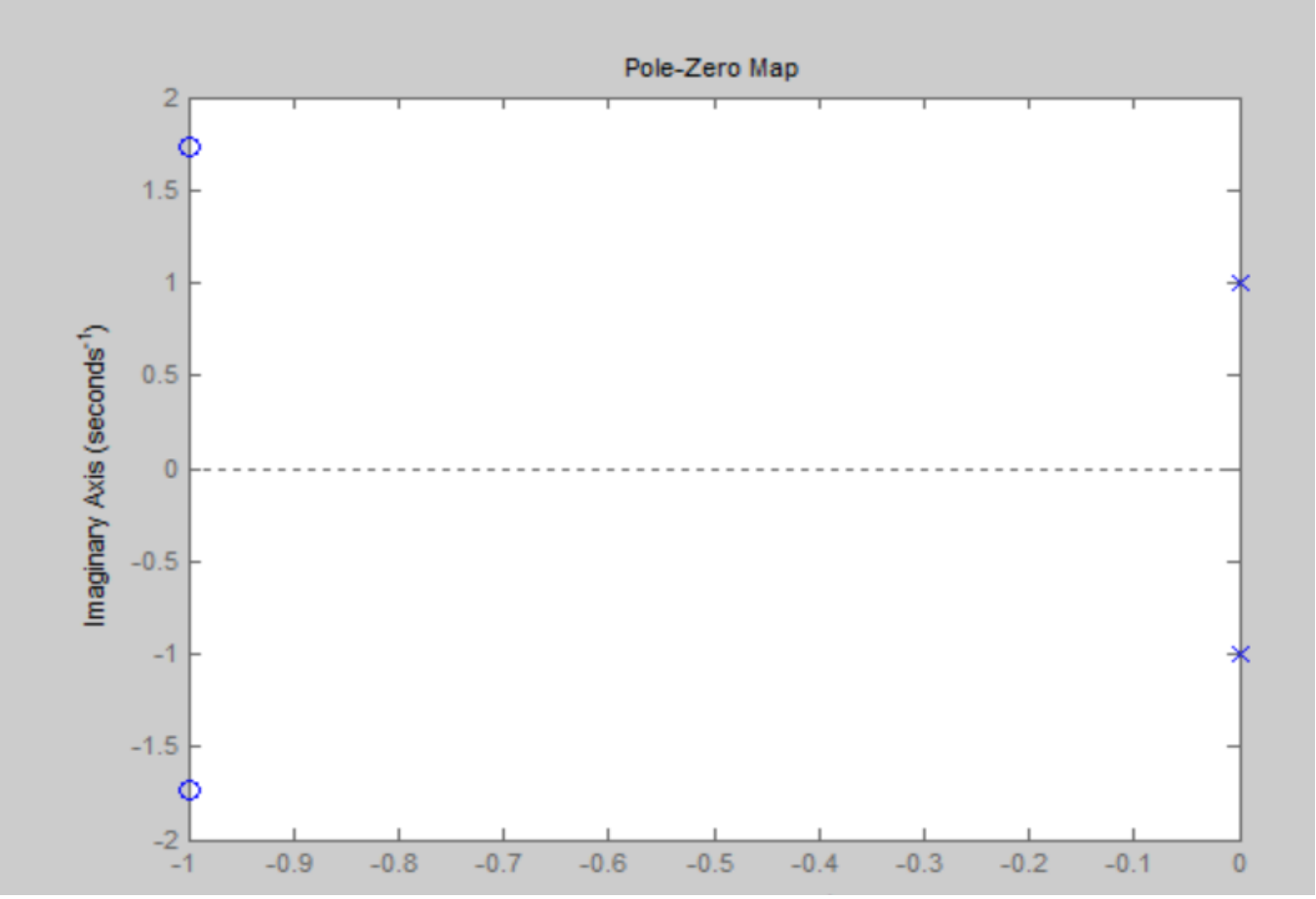
Task no 2: -

Marginally LTI system, the system which is neither stable nor unstable and has pole on the vertical axis of the plane.

Code: -

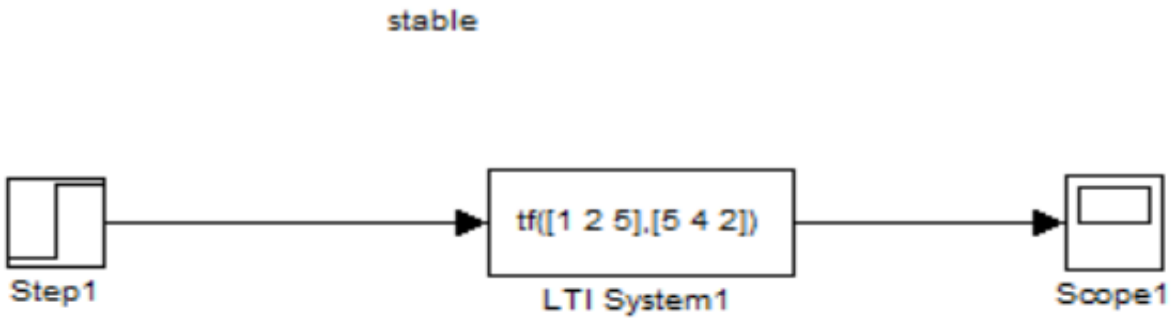
```
den = [-1 2 1];
nom = [1 2 5];
r=roots(p);

p=poly(r);
transfer_fuc = tf(nom,den);
pzmap(transfer_fuc);
```

Marginally stable: -

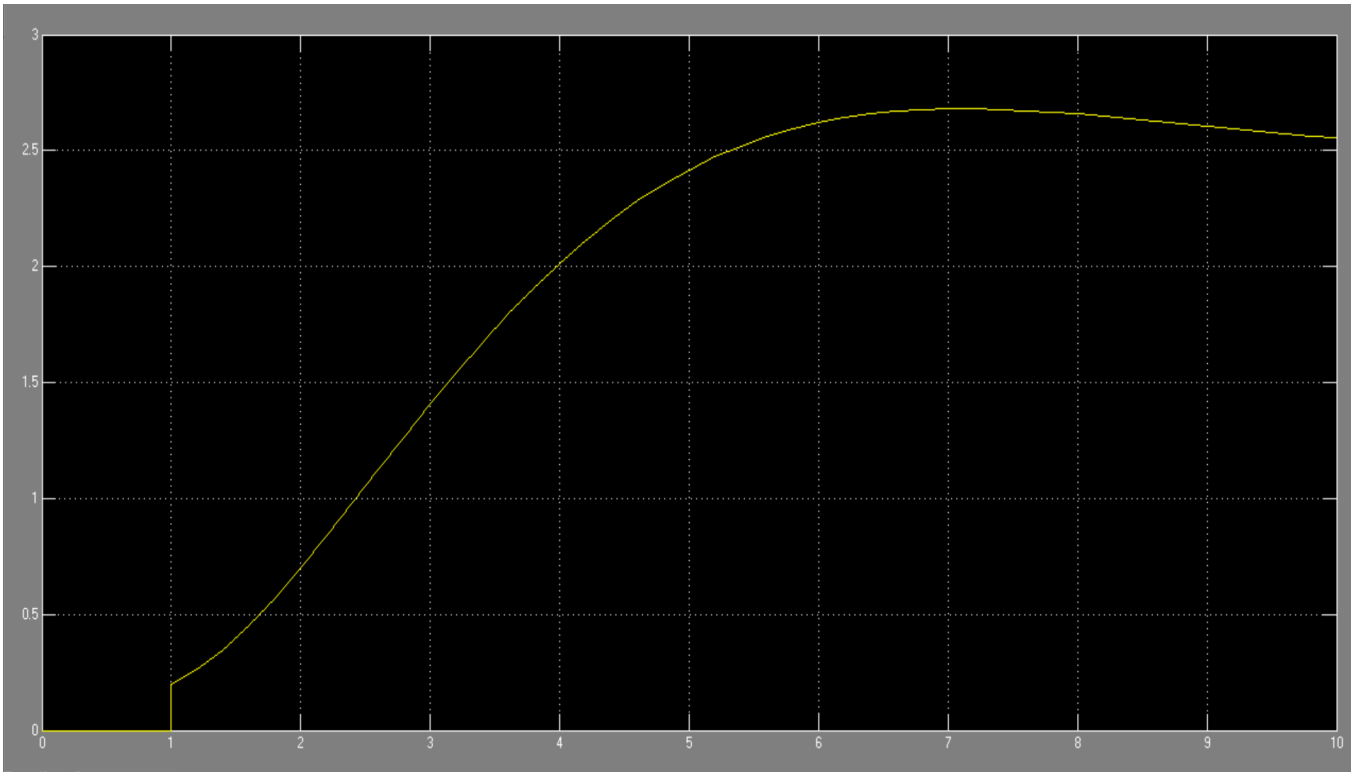


Simulink: -

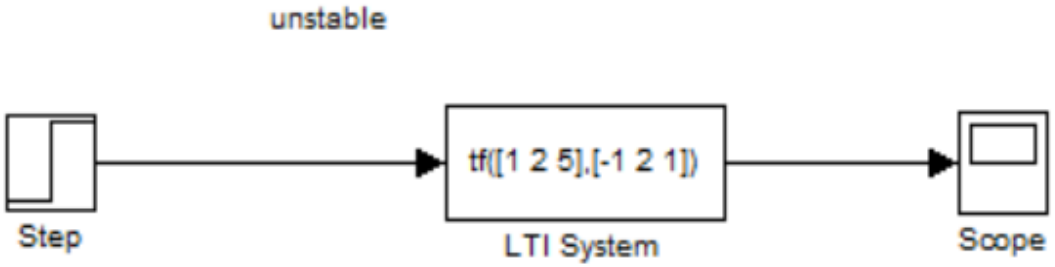
Stable: -



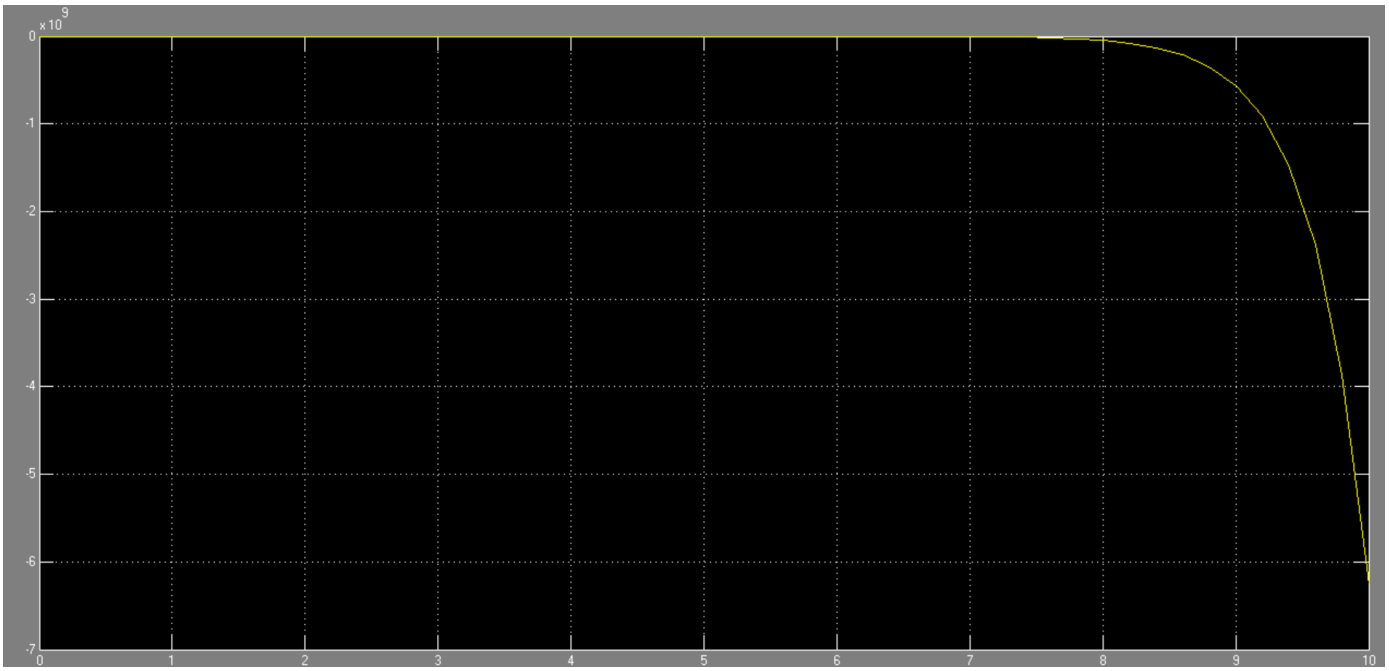
Scope: -



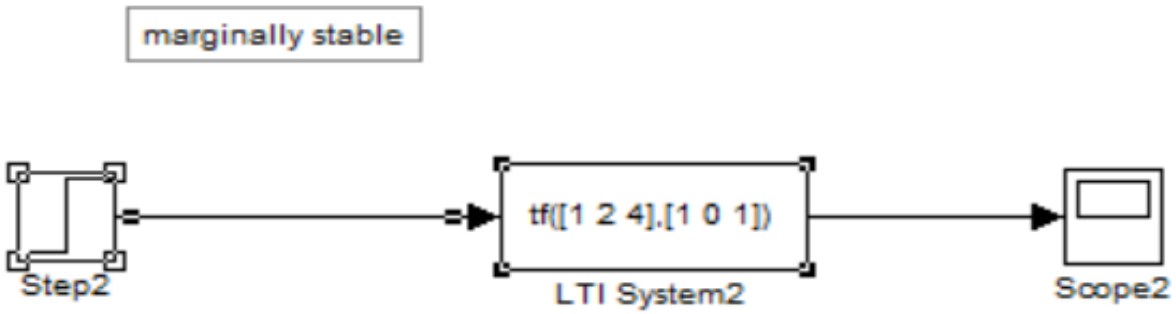
Unstable: -



Scope: -



Marginally stable: -



Scope: -