Table of Contents

```
% Praful Sigdel
% Linear Control Theory HW #4
```

B-6-1
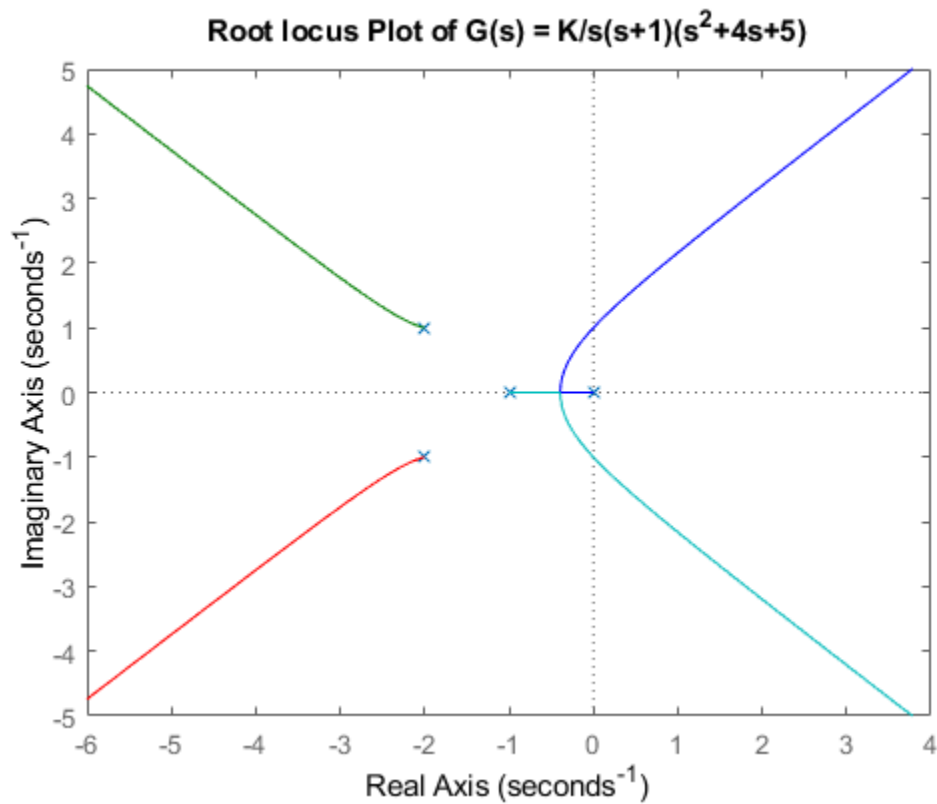
```
num = [0 1 1];
den = [1 0 0];
rlocus(num, den);
title('Root locus Plot of G(s) = K(s+1) / s^2');
```
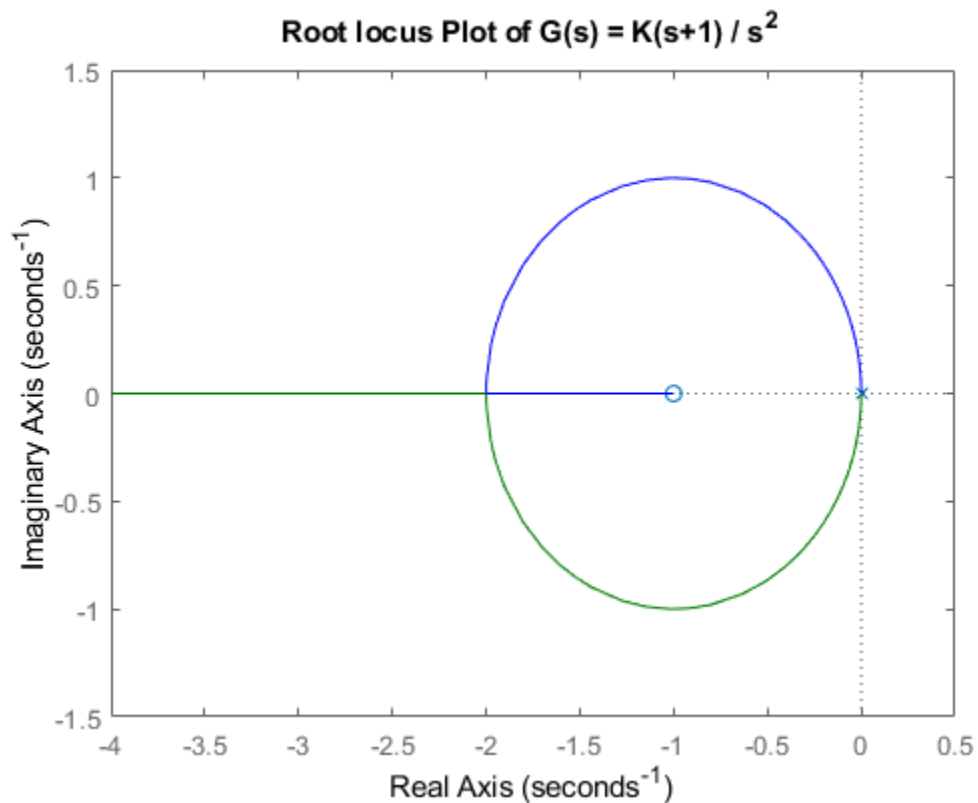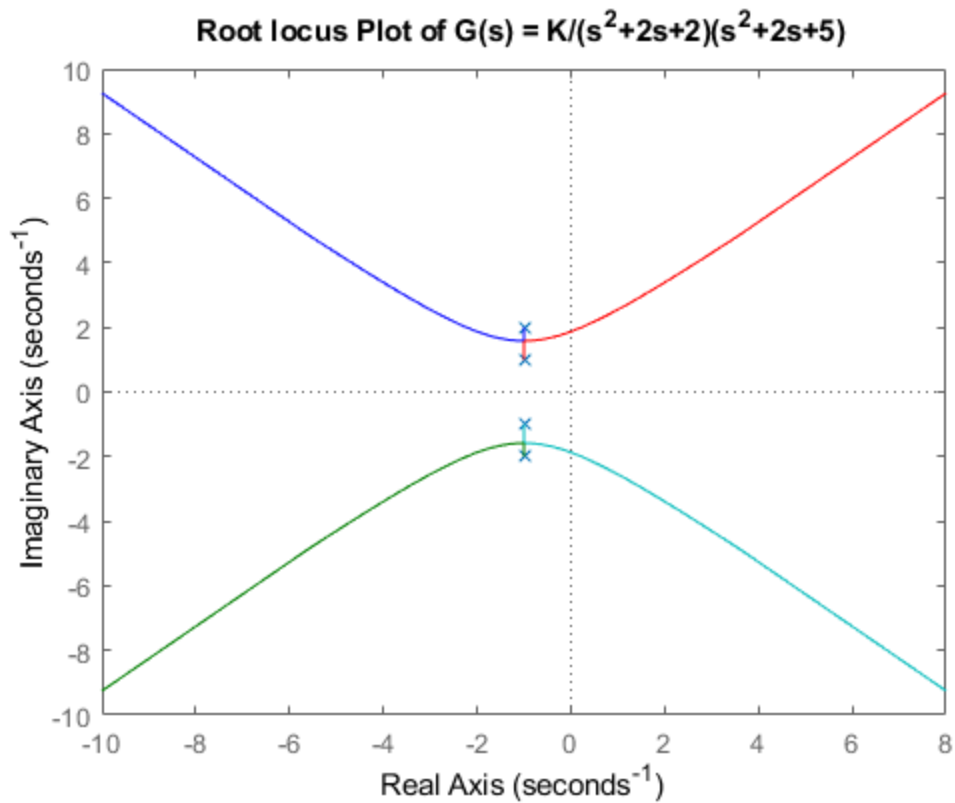
B-6-3

```
num = [0 0 1];
den = conv([1 1 0],[1 4 5]);
rlocus(num, den);
title('Root locus Plot of G(s) = K/s(s+1)(s^2+4s+5)');
```


Root locus Plot of G(s) = K/s(s+1)(s²+4s+5)

B-6-5

```
num = [0 0 1];
den = conv([1 2 2],[1 2 5]);
rlocus(num, den);
title('Root locus Plot of G(s) = K/(s^2+2s+2)(s^2+2s+5)');
```
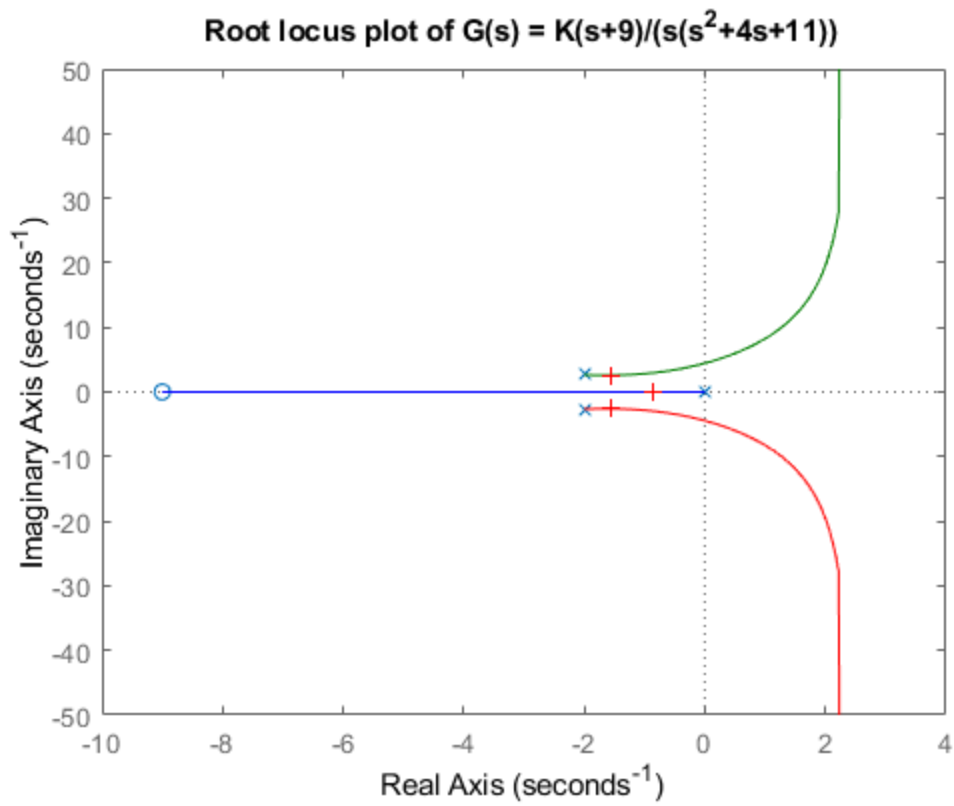
Root locus Plot of G(s) = K/(s^2+2s+2)(s^2+2s+5)

B-6-9

```
num = [0 0 1 9];
den = [1 4 11 0];
G = tf(num, den);
rlocus(num, den);
[k,poles] = rlocfind(G);
title('Root locus plot of G(s) = K(s+9)/(s(s^2+4s+11))');
```
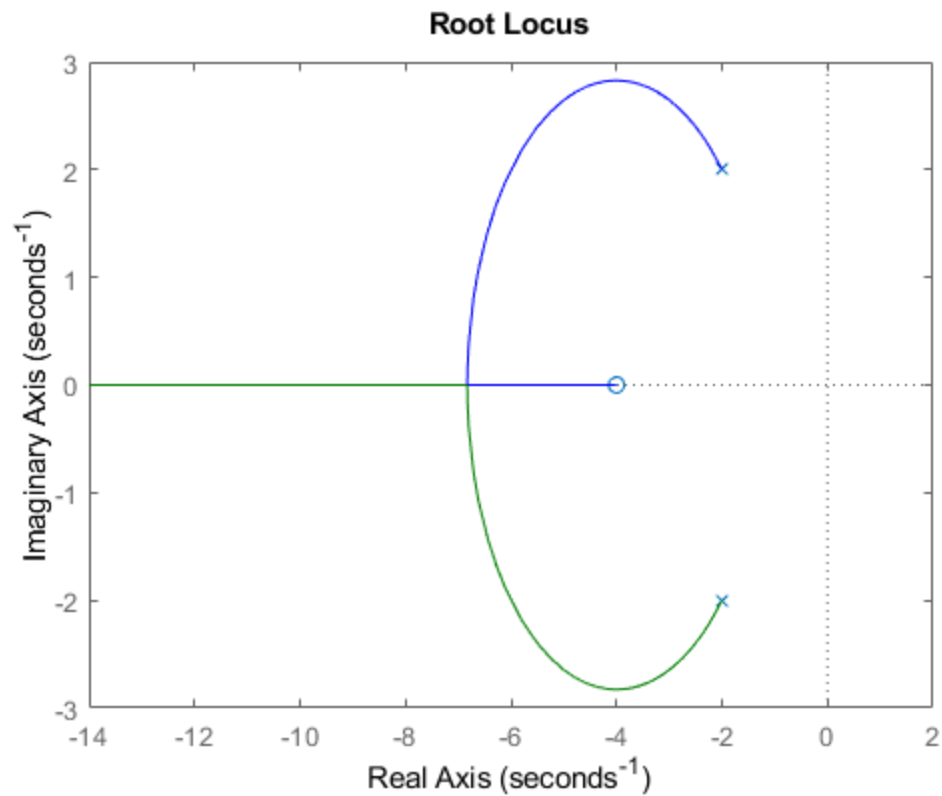
Select a point in the graphics window

selected_point =

  -1.5668 + 2.6087i

Root locus plot of G(s) = K(s+9)/(s(s^2+4s+11))
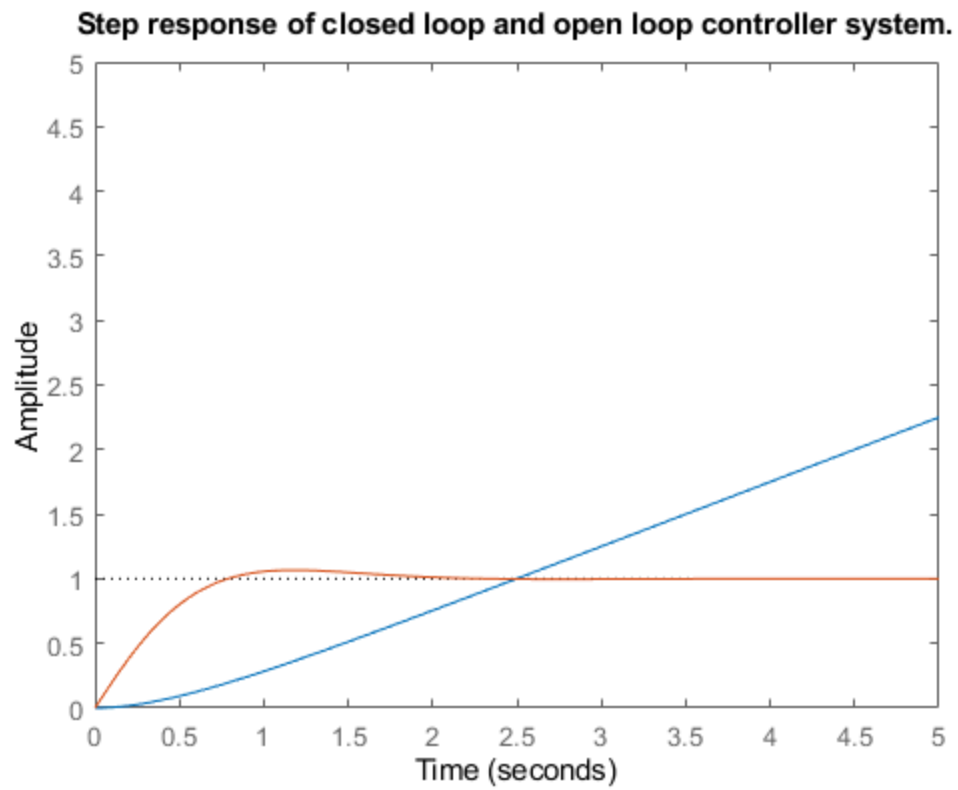

B-7-8 part a root locus

```
num = [0 2 8];
den  = [1 4 8];
rlocus(num, den); % root locus of the design
```

Root Locus

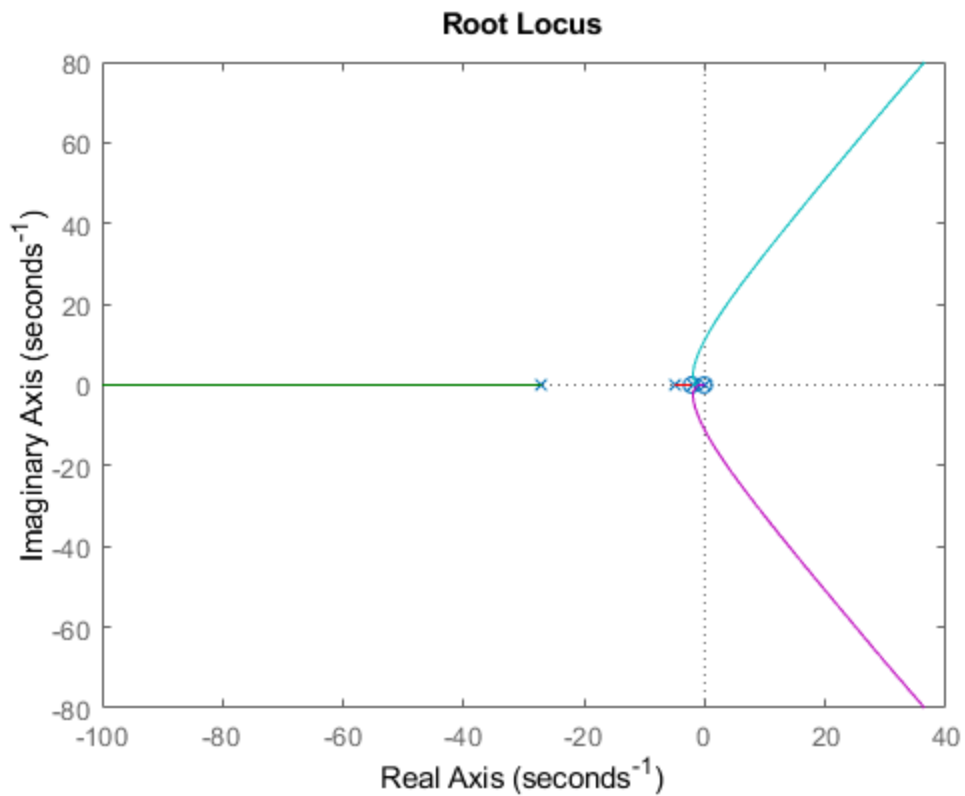# B-7-8 part b step input response

```
num1 = [0 0 1];
den1 = [1 2 0];
num = [0 2 8];
den  = [1 4 8];
step(num1, den1);
hold on
step(num, den);
v = [0 5 0 5]; axis(v)
title('Step response of closed loop and open loop controller system.');
hold off
```
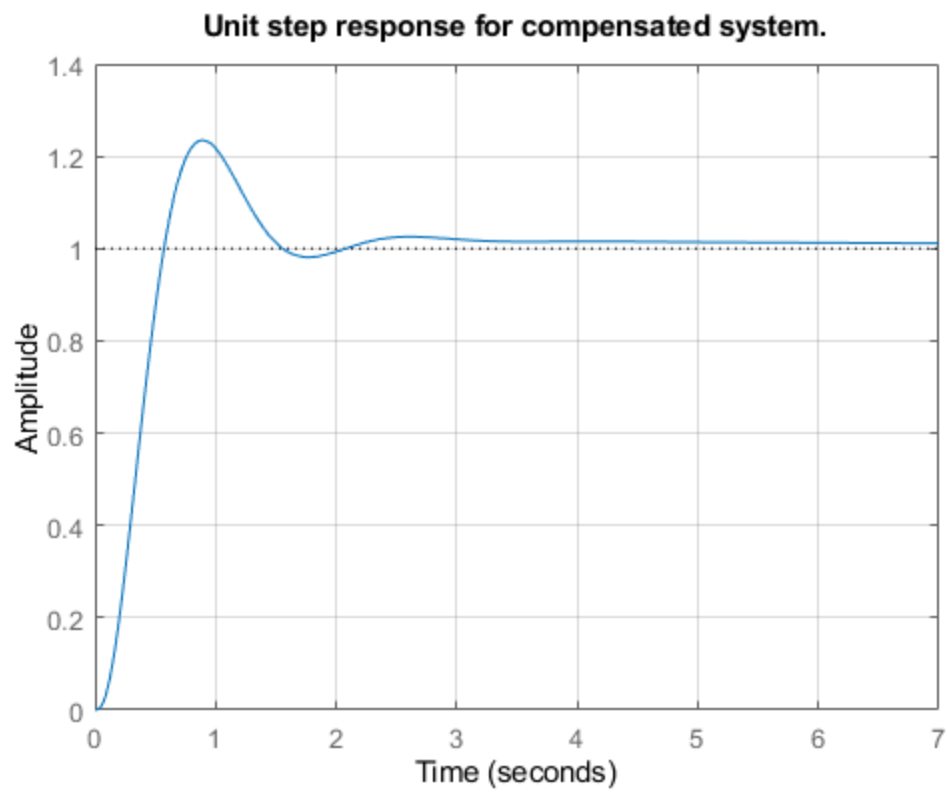
Step response of closed loop and open loop controller system.

B-7-13

```
num = [0 0 0 500 1159 110.9];
den = [1 34.118 200.049 272.734 2.2176 0];
rlocus(num, den);
```

Root Locus

B-7-13 part b step response for closed loop

```
num = [0 0 0 500 1159 110.9];
den = [1 34.118 200.049 772.734 1161.2176 110.9];
step(num, den);
grid;
title('Unit step response for compensated system.');
```

Unit step response for compensated system.

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