TALLER MATLAB CORTE 2
JOSÉ ROLDÁN

1.

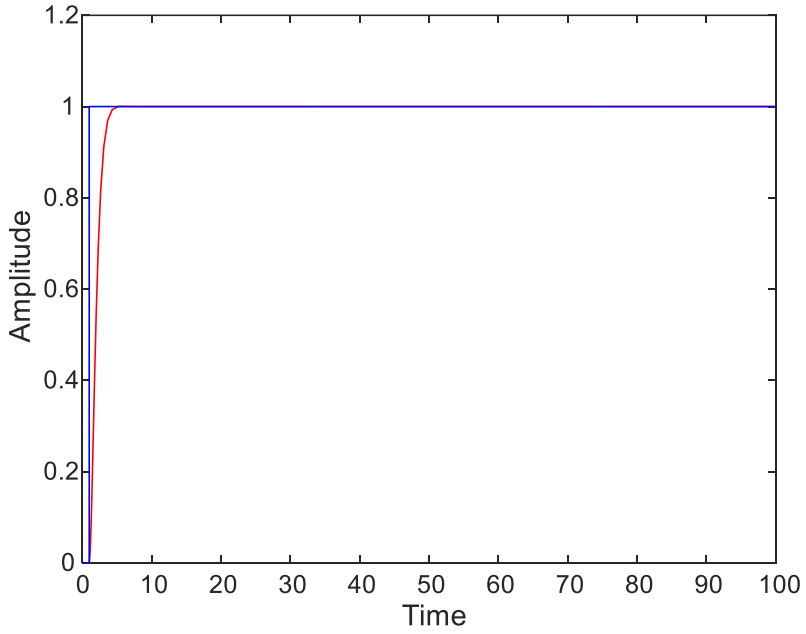
c)

Código

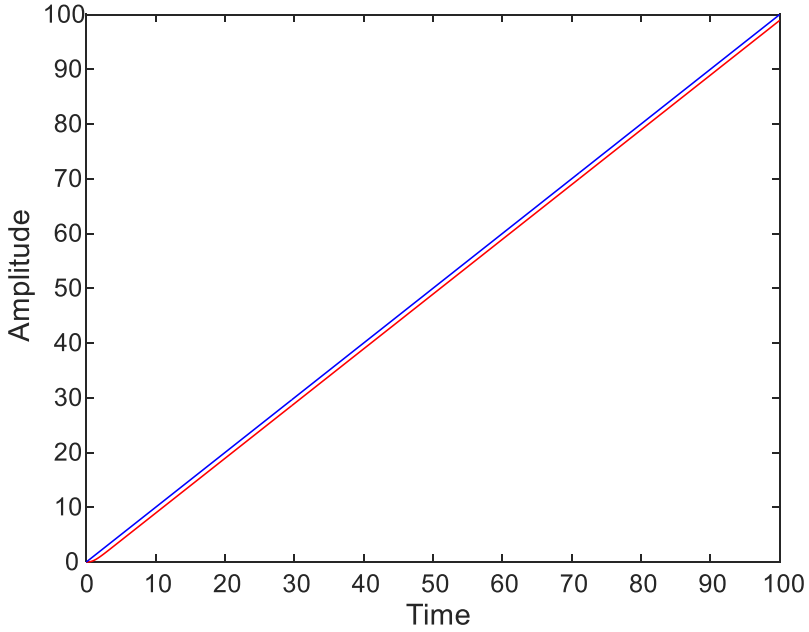
```
s=tf('s');
Ta=3/(s^2+3.2*s+3);
s=tf('s');
Tb=(-1.8*(s-1))/(s^2+5.2*s+5);
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
step(Ta)%Respuesta al escalon
step(1/s,Ta)%Respuesta a la rampa
impulse(Ta)%Respuesta a la parabola
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(step_a.time,step_a.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(step_a.time,step_a.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(ramp_a.time,ramp_a.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(ramp_a.time,ramp_a.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(parab_a.time,parab_a.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(parab_a.time,parab_a.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
step(Tb)%Respuesta al escalon
step(Tb / s)%Respuesta a la rampa
impulse(Tb)%Respuesta a la parabola
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(step_b.time,step_b.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(step_b.time,step_b.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(ramp_b.time,ramp_b.data(:,1),'r')
xlabel('Time')
```

```
ylabel('Amplitude')
hold on
plot(ramp_b.time,ramp_b.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(parab_b.time,parab_b.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(parab_b.time,parab_b.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
```

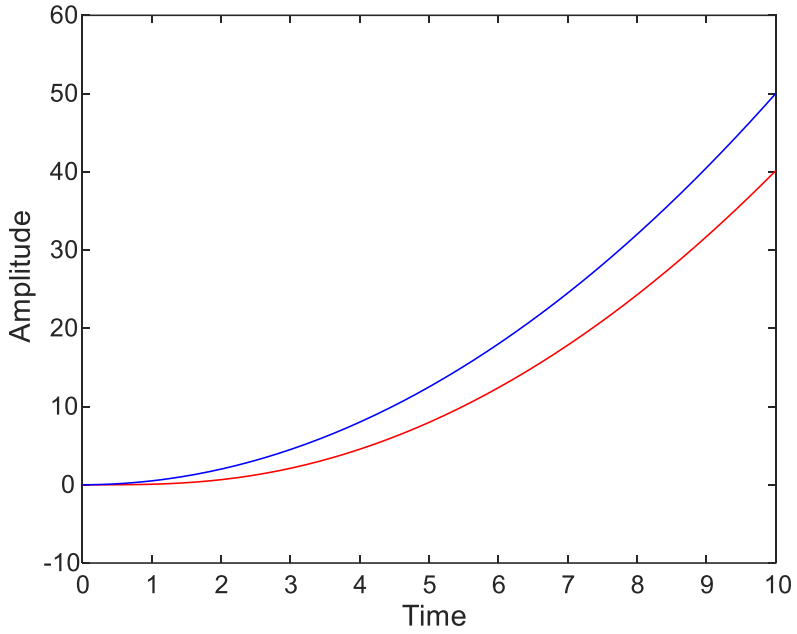
STEP a)



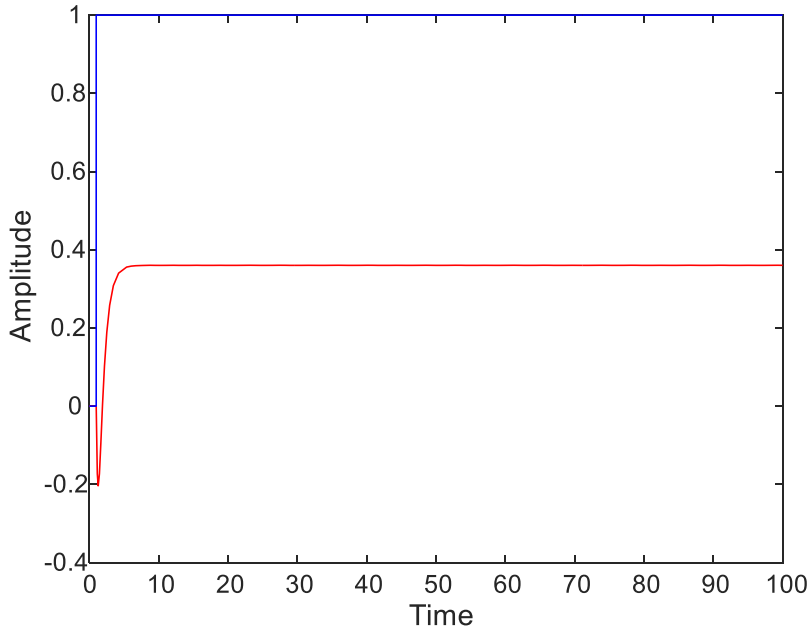
RAMP a)



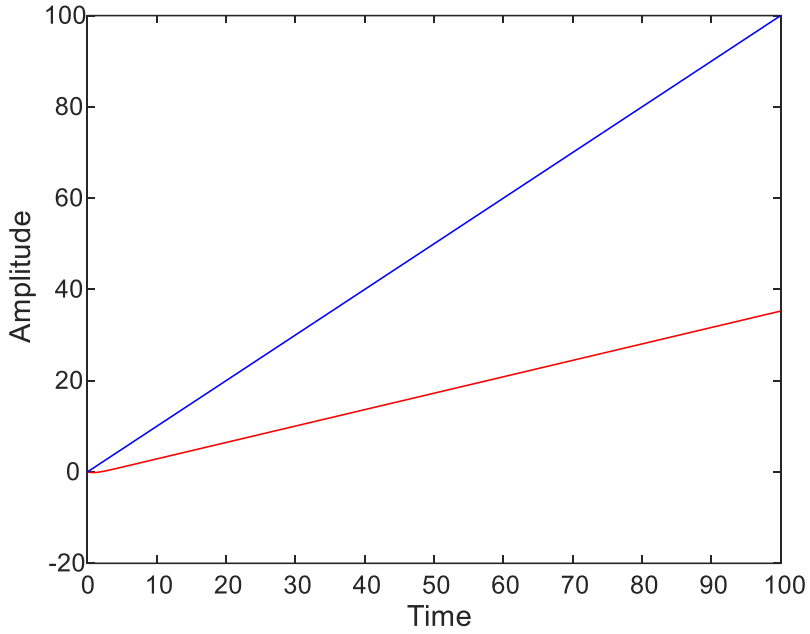
PARABLE a)


60
50
40
30
20
10
0
-10
Amplitude
0 1 2 3 4 5 6 7 8 9 10
Time

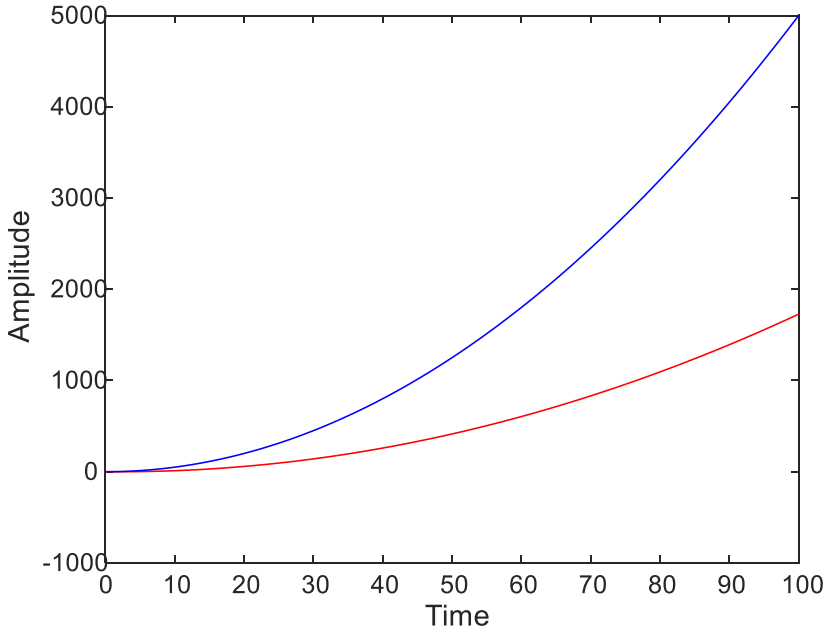
STEP b)


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
Amplitude
0 10 20 30 40 50 60 70 80 90 100
Time

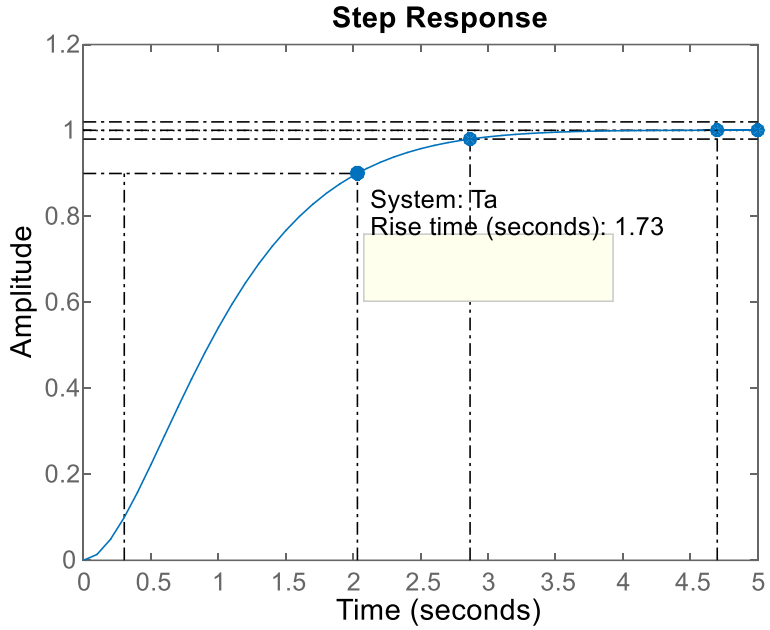
RAMP b)

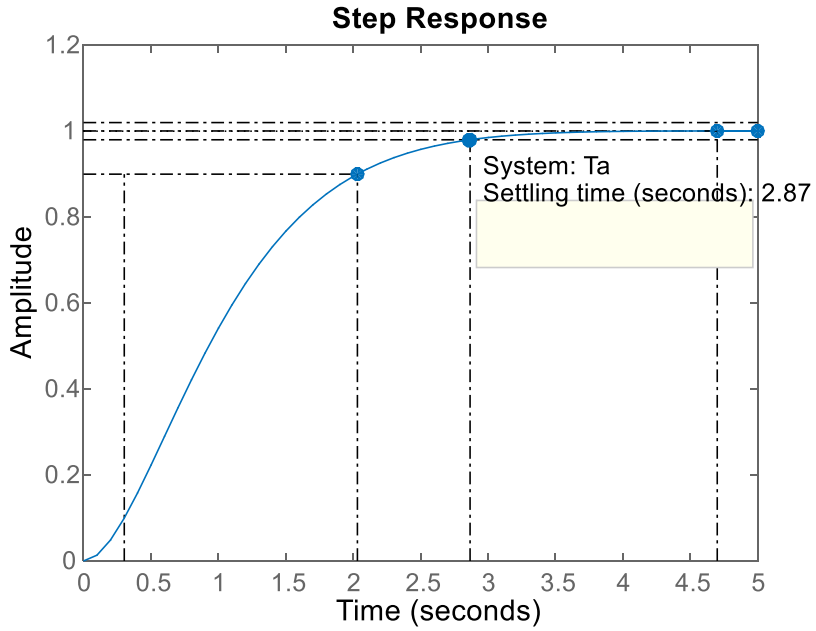


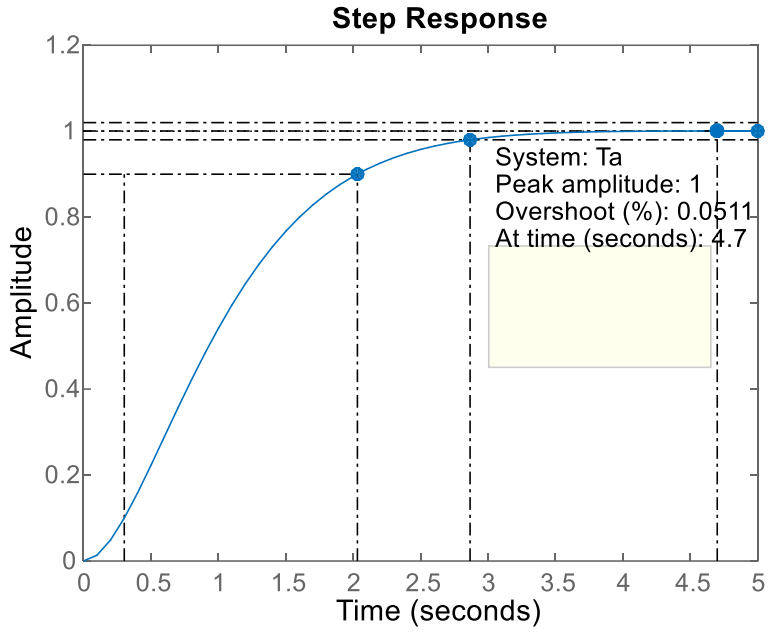
PARABLE b)

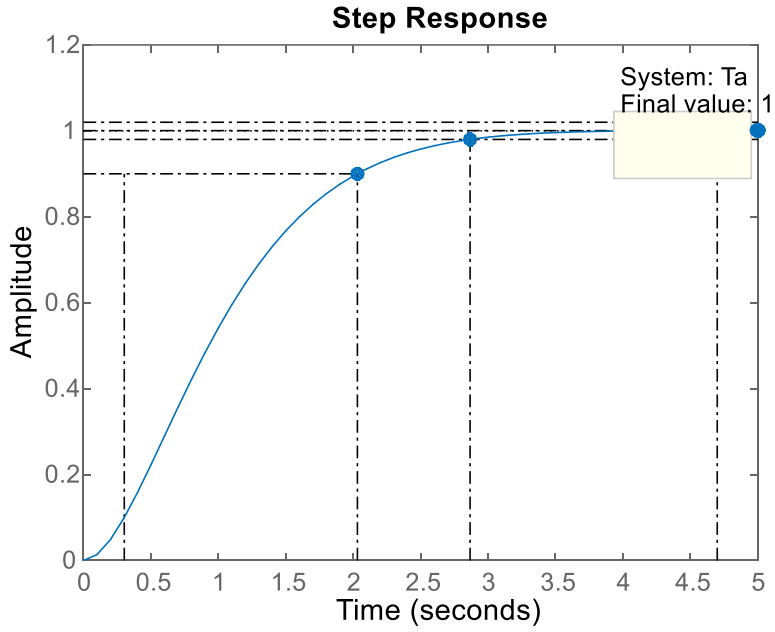


Indicadores de desempeño a)

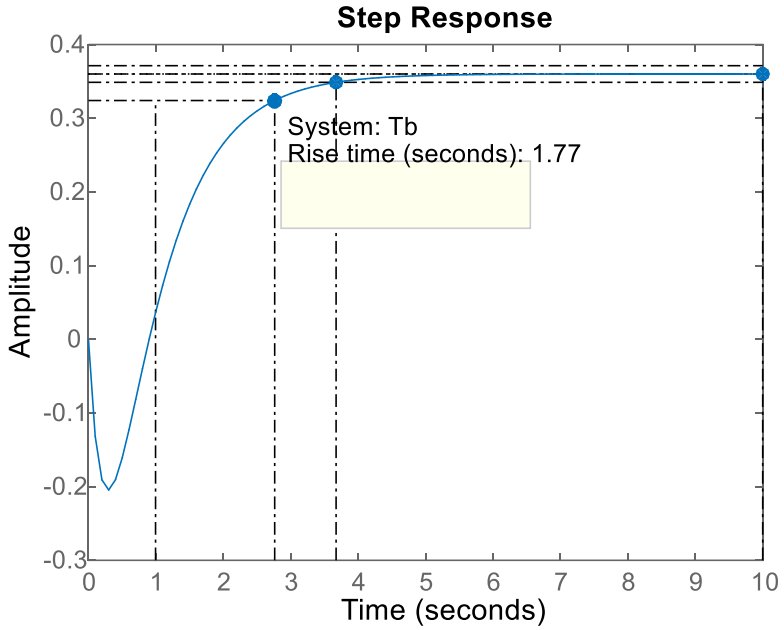


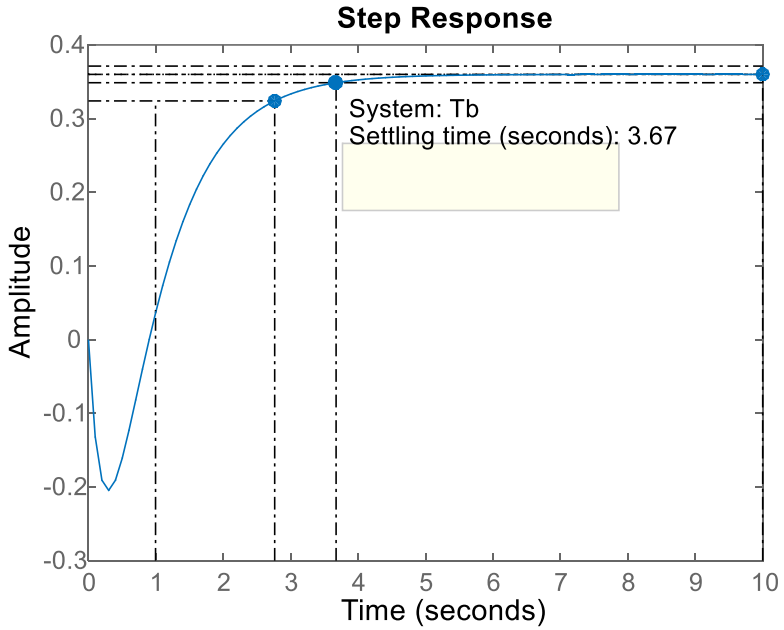


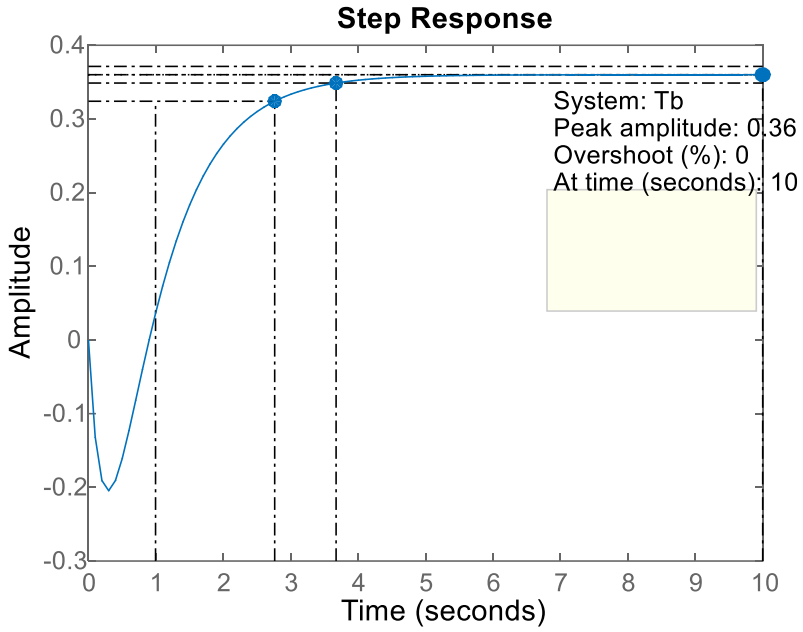

Step Response
System: Ta
Peak amplitude: 1
Overshoot (%): 0.0511
At time (seconds): 4.7
Amplitude
Time (seconds)
0
0.2
0.4
0.6
0.8
1
1.2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

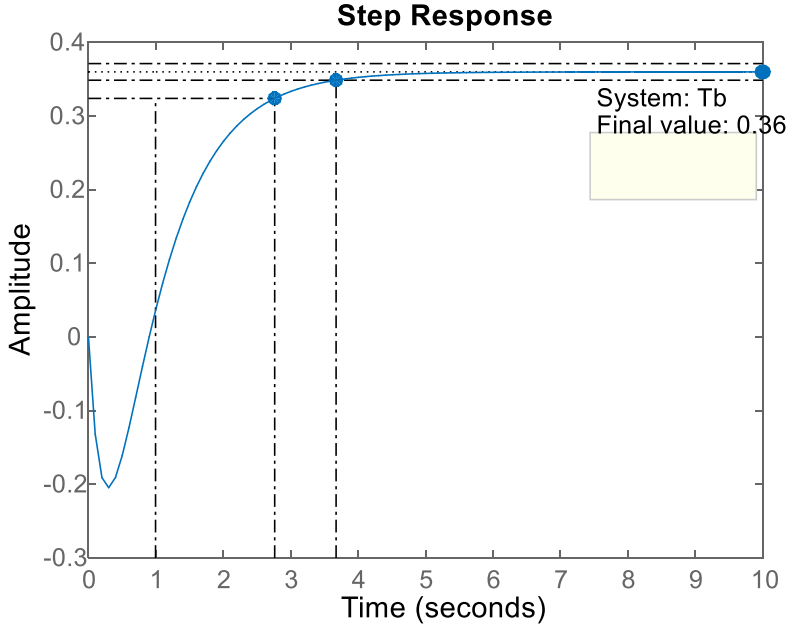

Step Response
System: Ta
Final value: 1
Amplitude
Time (seconds)
0
0.2
0.4
0.6
0.8
1
1.2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

Indicadores de desempeño b)






Step Response
System: Tb
Peak amplitude: 0.36
Overshoot (%): 0
At time (seconds): 10
Amplitude
Time (seconds)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
0
1
2
3
4
5
6
7
8
9
10

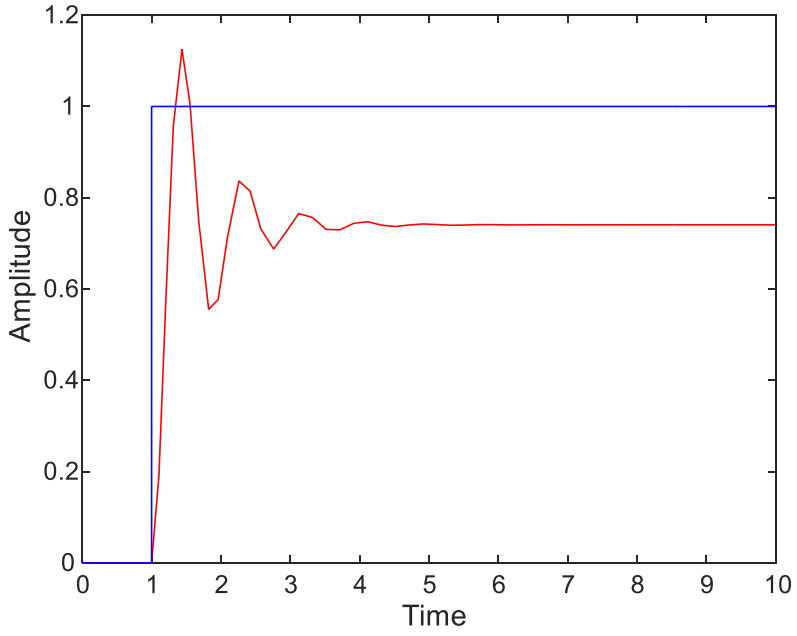

Step Response
System: Tb
Final value: 0.36
Amplitude
Time (seconds)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
0
1
2
3
4
5
6
7
8
9
10

2.

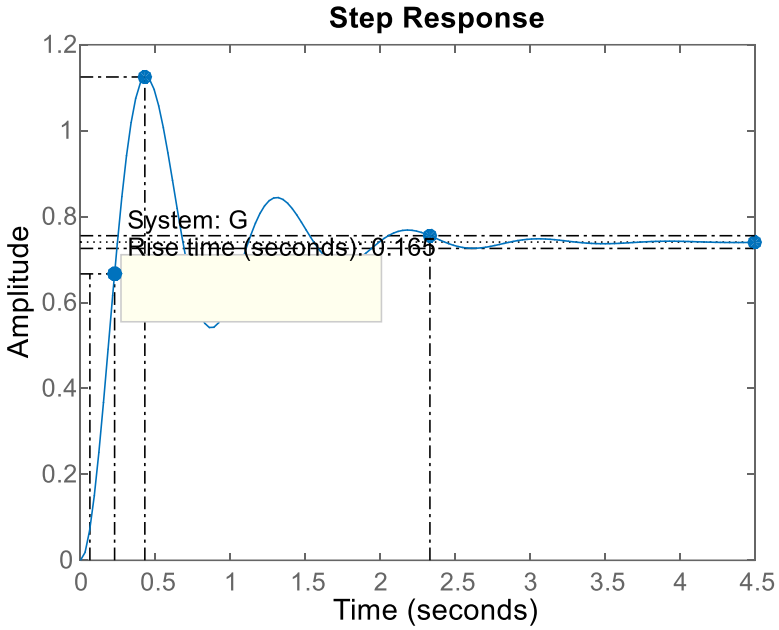
c)

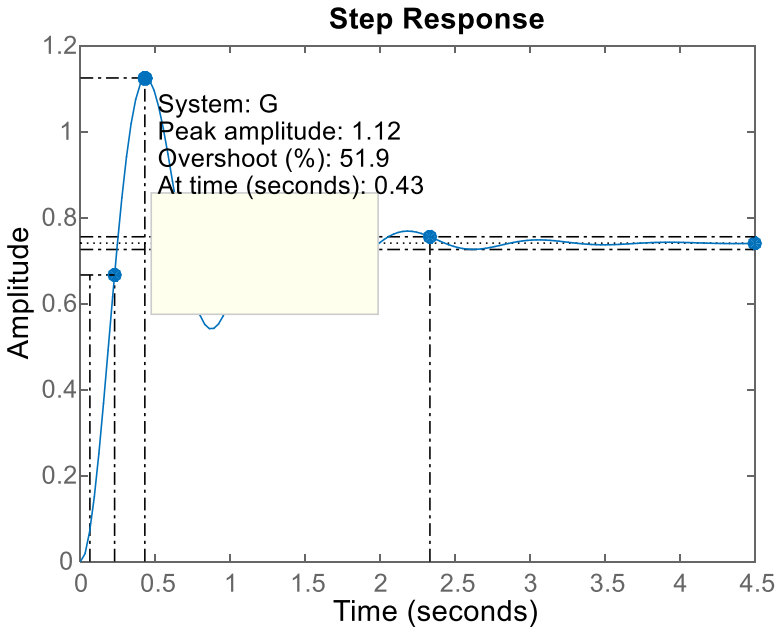
Código

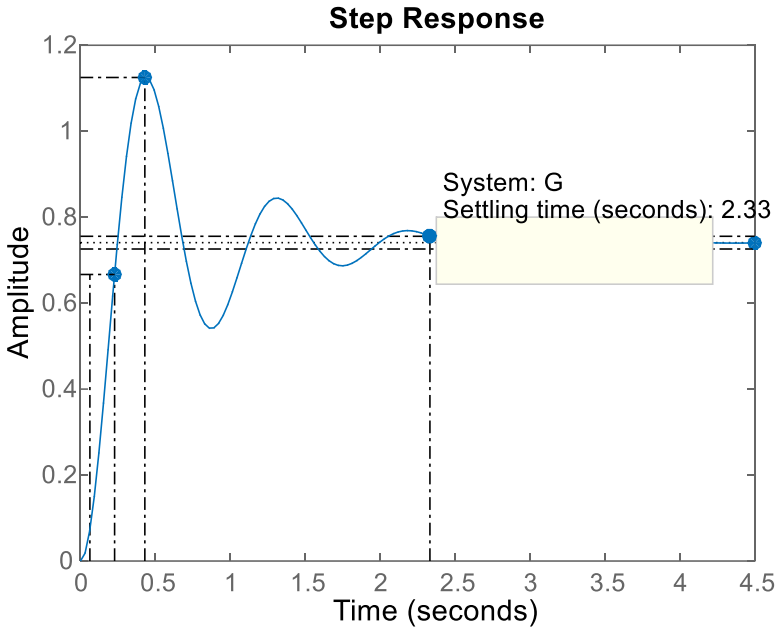
```
s=tf('s');
Kp=1;%Kp mayor a -14/40
G=40*Kp/(s^2+3*s+14+40*Kp);
step(G)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(Controler.time,Controler.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(Controler.time,Controler.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
```

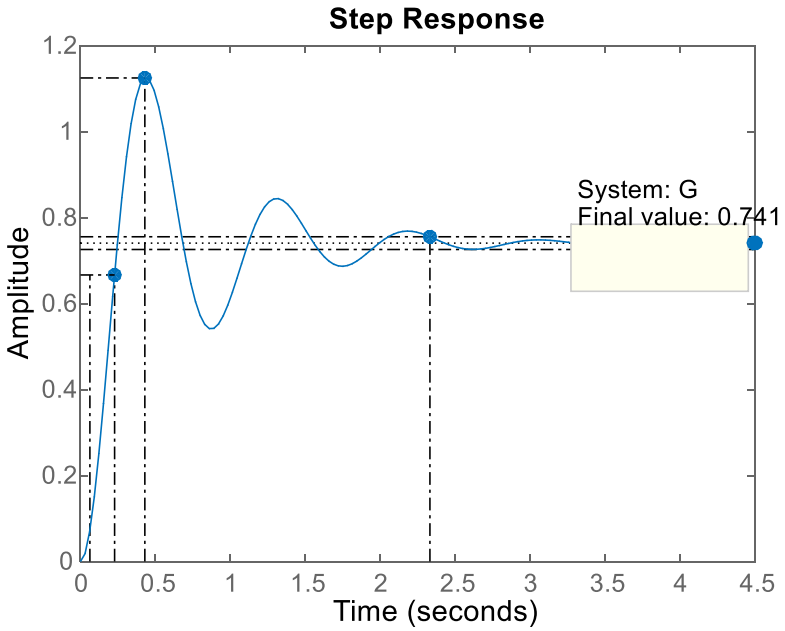


Indicadores de desempeño






Step Response
System: G
Settling time (seconds): 2.33
Amplitude
Time (seconds)
0
0.2
0.4
0.6
0.8
1
1.2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

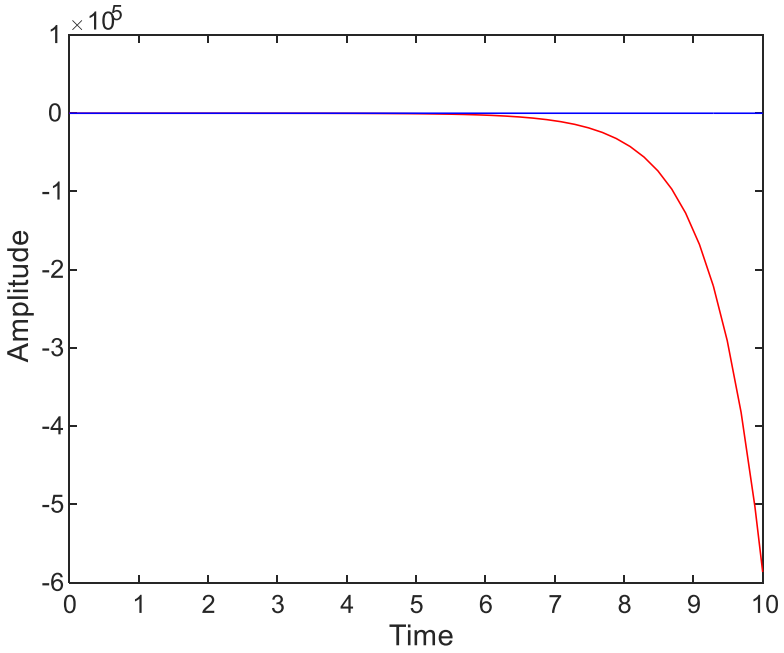

Step Response
System: G
Final value: 0.741
Amplitude
Time (seconds)
0
0.2
0.4
0.6
0.8
1
1.2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

d)

Código

```
s=tf('s');
Kp=-0.5;%Kp menor a -14/40
G=40*Kp/(s^2+3*s+14+40*Kp);
step(G)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
plot(Controler.time,Controler.data(:,1),'r')
xlabel('Time')
ylabel('Amplitude')
hold on
plot(Controler.time,Controler.data(:,2),'b')
xlabel('Time')
ylabel('Amplitude')
```

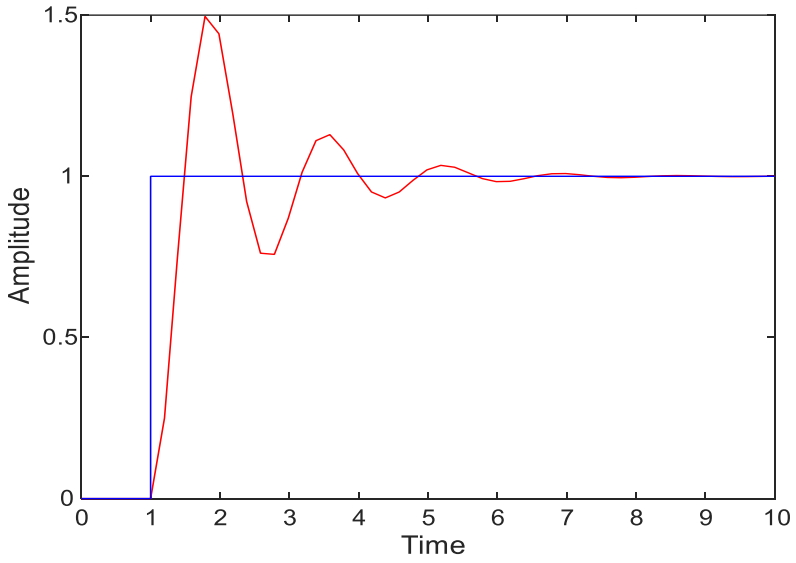
Kp=-0.5



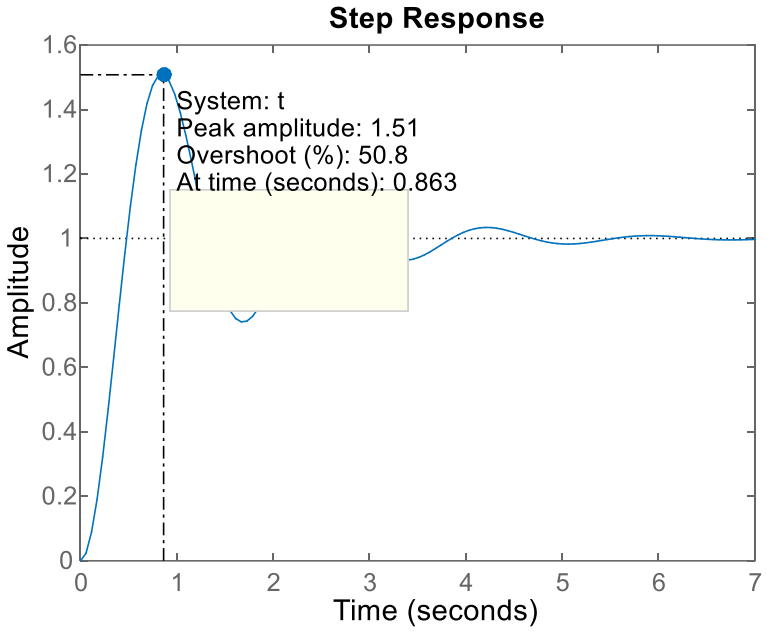
Indicadores de desempeño

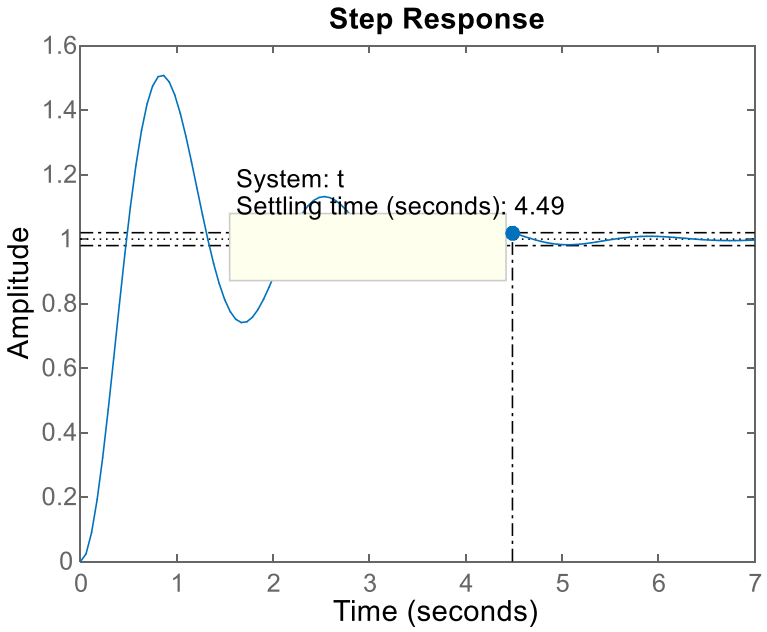
No posee indicadores de desempeño debido a que es inestable.

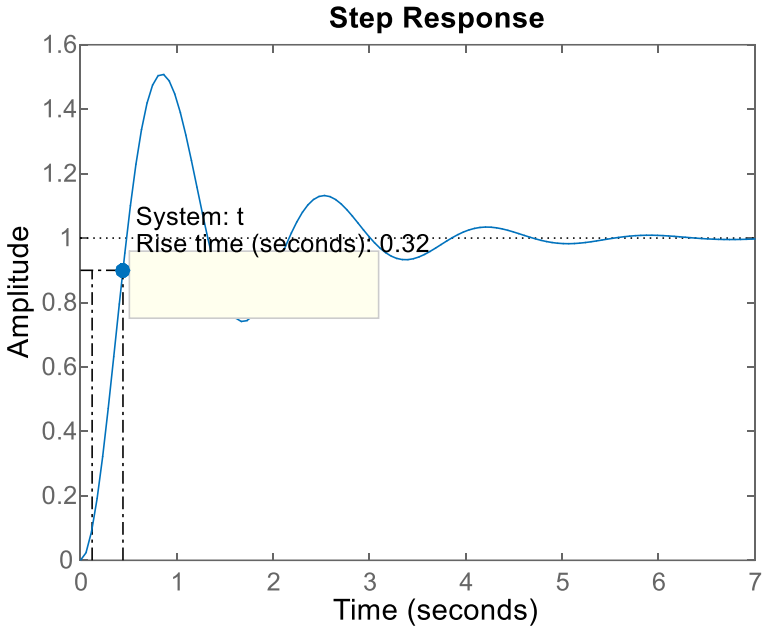
3.

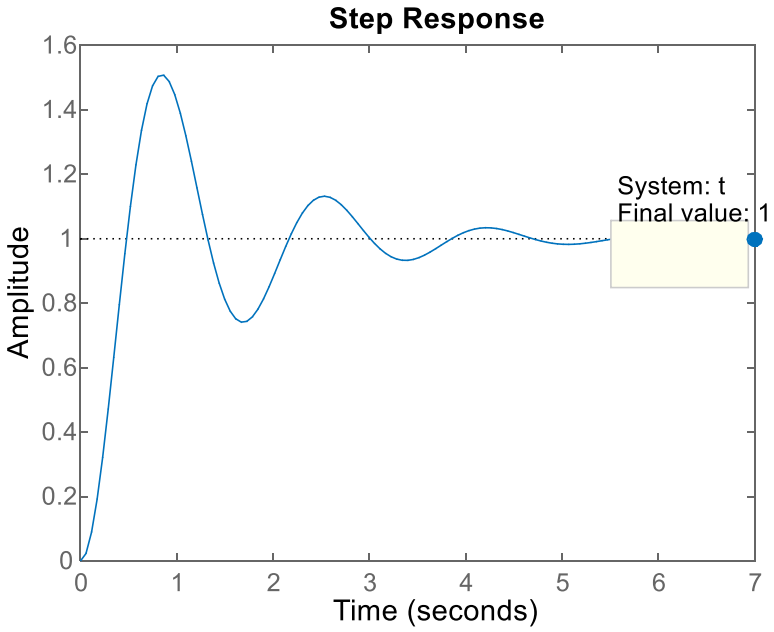


Indicadores de desempeño






Step Response
Amplitude
Time (seconds)
System: t
Rise time (seconds): 0.32
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
0
1
2
3
4
5
6
7


Step Response
Amplitude
Time (seconds)
System: t
Final value: 1
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
0
1
2
3
4
5
6
7