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%Daniel Pacheco
%
% Matlab 6
clear;
clc;
close all;

%1
sys = tf([0,0,80,480,800],[1,12,50,68,29]);
[h,t] = impulse(sys);
figure;
impz(sys);

%2
sys2 = zpk([-3-1i,-3+1i],[-1, -1, -5 - 2i, -5 + 2i],80);
[h,t] = impulse(sys2);
figure();
impzplot(sys, 'c', sys2, '--m');
legend('tf','zpk');

%3
y=lsim(sys,h,t);
simi=lsiminfo(y,t);
fprintf('P 3\n');
fprintf('\tSettling time:\t%0.2d\n',simi.SettlingTime);
fprintf('\tMin:\t%0.2d\n',simi.Min);
fprintf('\tMin time:\t%0.2d\n',simi.MinTime);
fprintf('\tMax:\t%d\n',simi.Max);
fprintf('\tMax time:\t%0.2d\n\n',simi.MaxTime);

%4
[g,t]=step(sys);
figure();
step(sys);
bigstepper=stepinfo(sys);
fprintf('P 4\n');
fprintf('\tRise time:\t%0.2d\n',bigstepper.RiseTime);
fprintf('\tSettling time:\t%0.2d\n',bigstepper.SettlingTime);
fprintf('\tSettling min:\t%0.2d\n',bigstepper.SettlingMin);
fprintf('\tSettling max:\t%0.2d\n',bigstepper.SettlingMax);
fprintf('\tOvershoot:\t%0.2d\n',bigstepper.Overshoot);
fprintf('\tUndershoot:\t%0.2d\n',bigstepper.Undershoot);
fprintf('\tPeak:\t%0.2d\n',bigstepper.Peak);
fprintf('\tPeak time:\t%0.2d\n',bigstepper.PeakTime);

%5
[x,t]=gensig('square',2,10,0.01);
y=lsim(sys,x,t);
figure();
lsim(sys,x,t);
simi=lsiminfo(y,t);

```

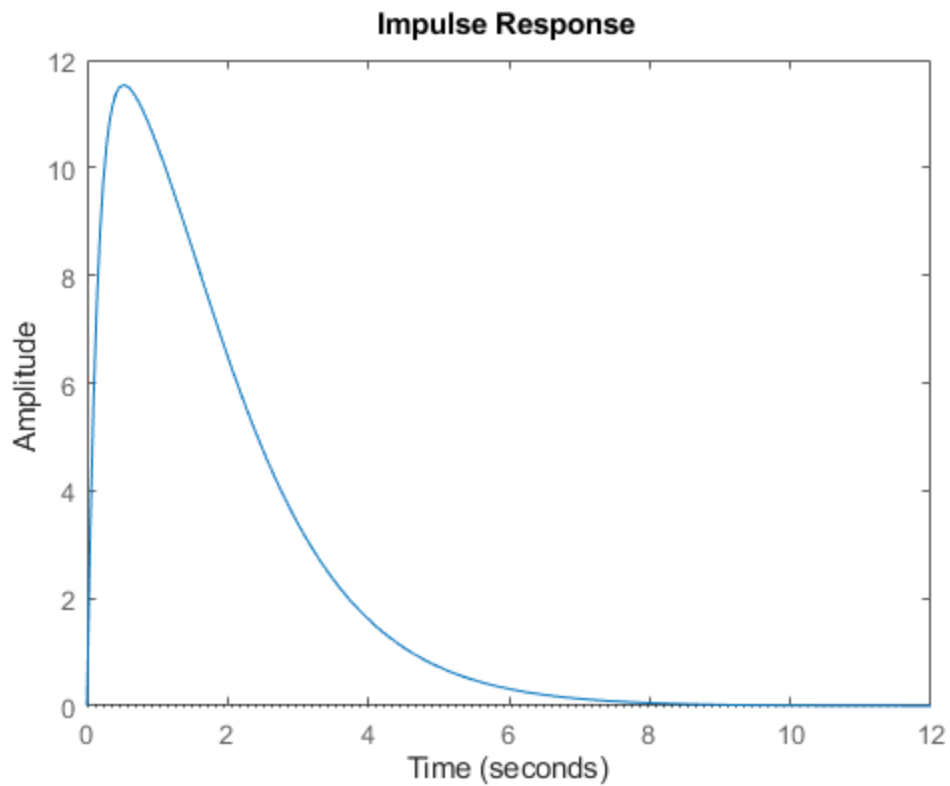
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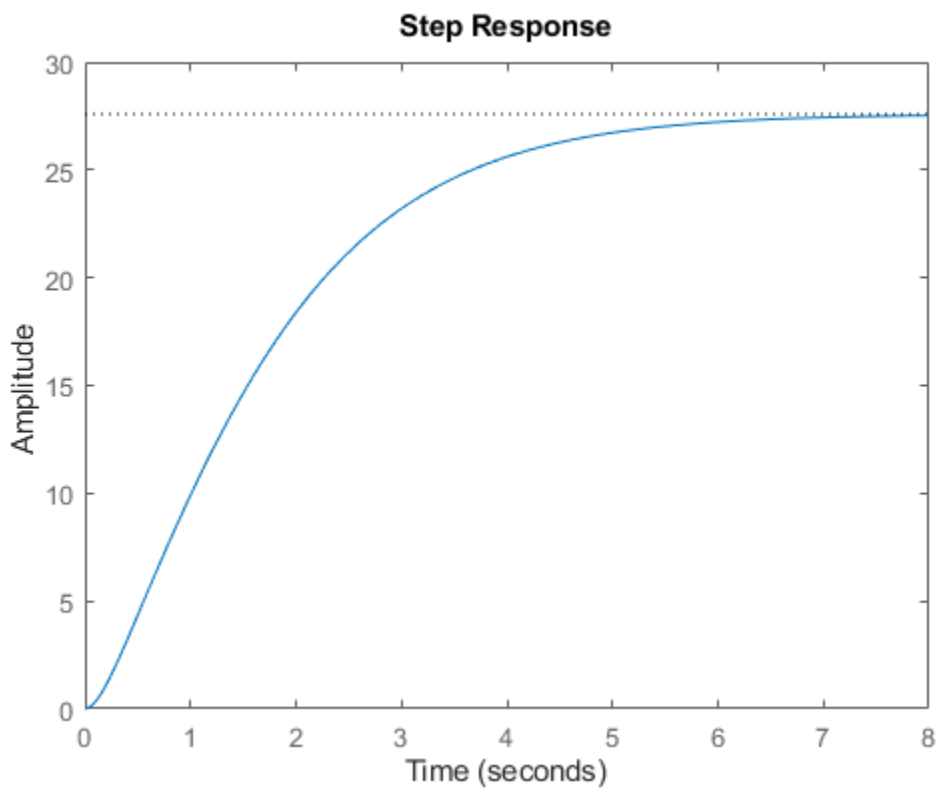
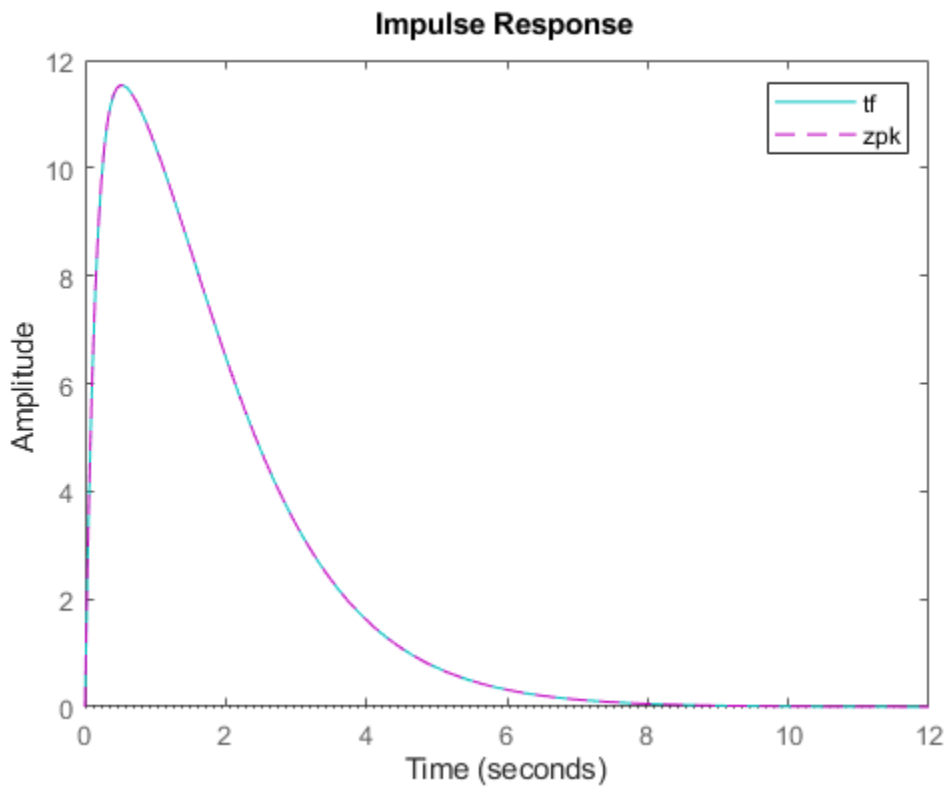
```
%6
figure();
bode(sys, {10^(-1), 10^(3)});
```

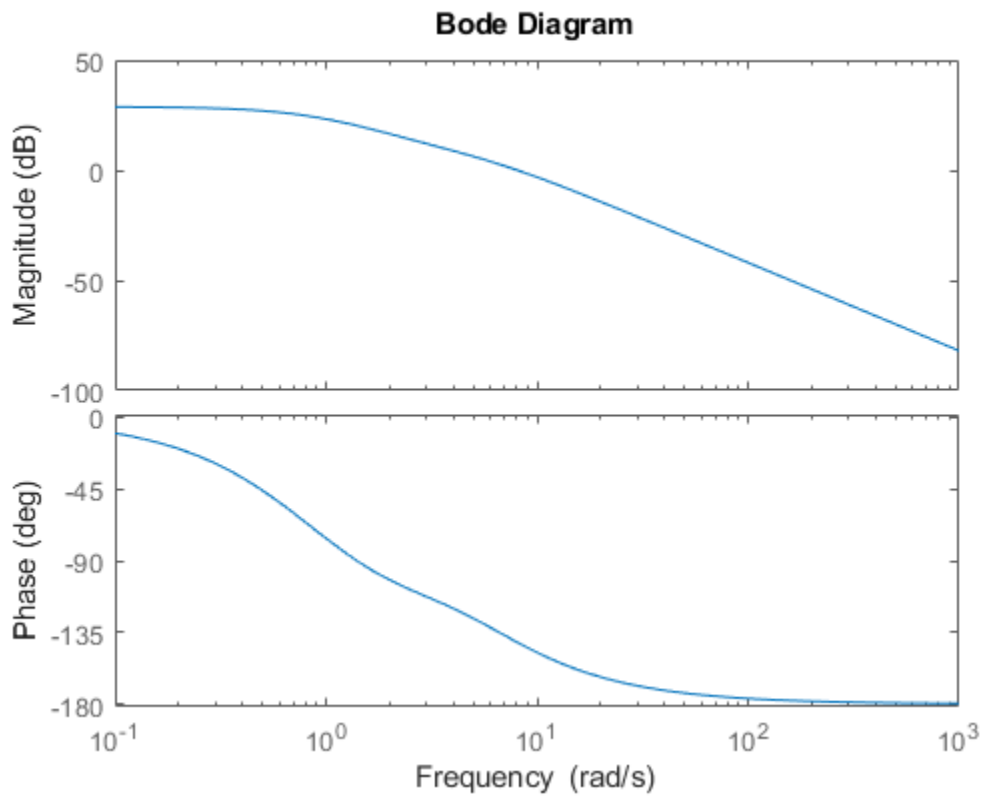
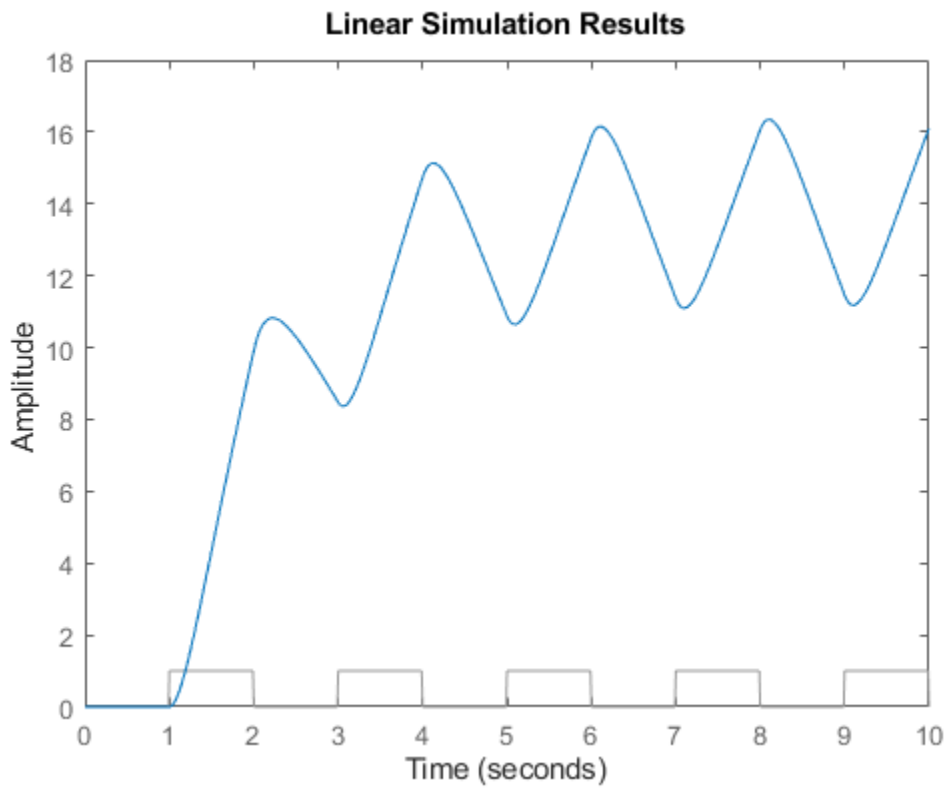
```
%7
figure();
pzplot(sys);
axis([-6, 0, -4, 4])
```

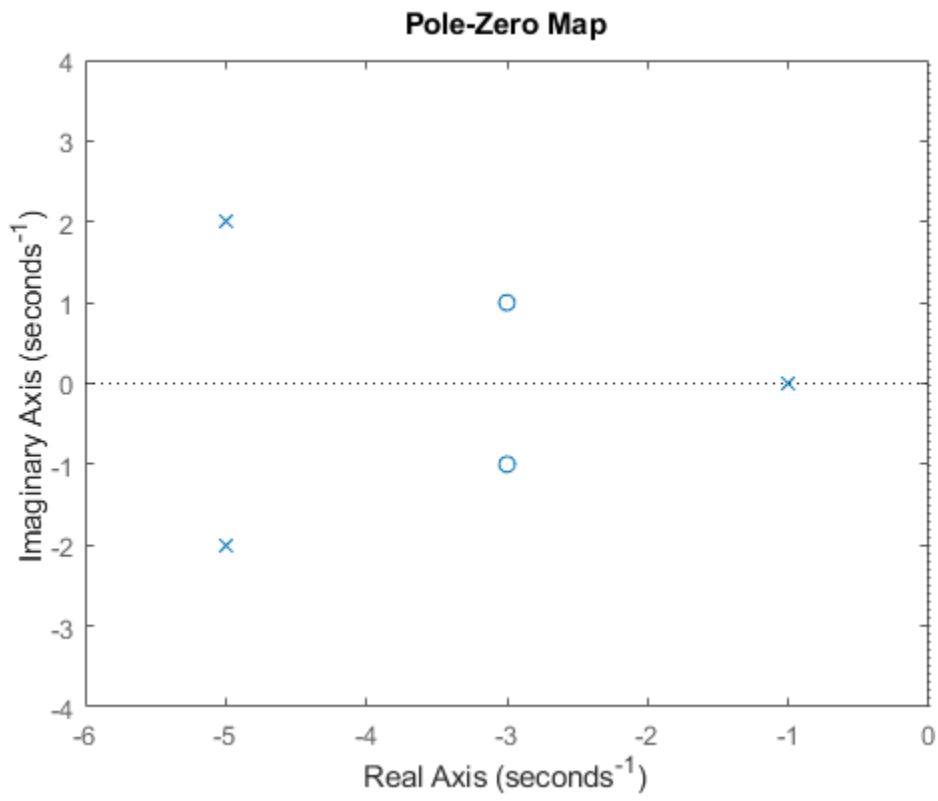
```
P 3
Settling time: 1.06e+01
Min: 00
Min time: 00
Max: 1.779520e+02
Max time: 2.41e+00
```

```
P 4
Rise time: 3.23e+00
Settling time: 5.53e+00
Settling min: 2.48e+01
Settling max: 2.76e+01
Overshoot: 00
Undershoot: 00
Peak: 2.76e+01
Peak time: 8.70e+00
```









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