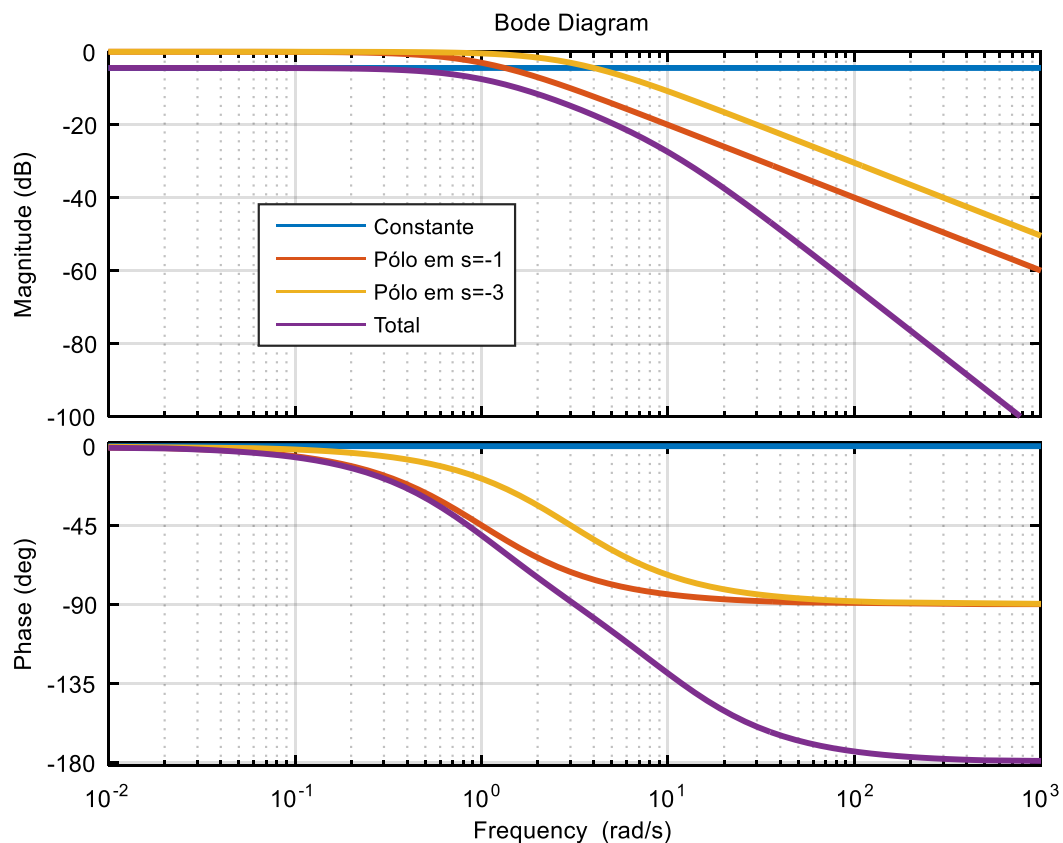




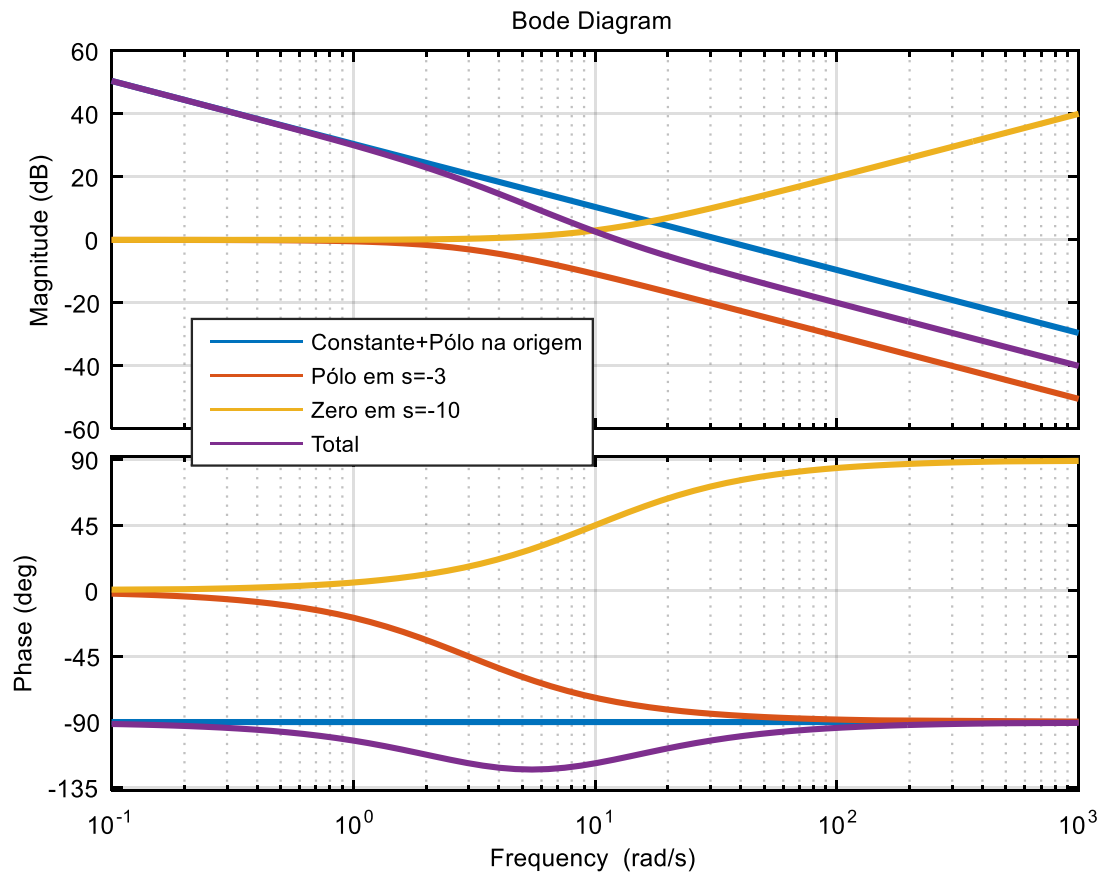
```
%% Exercício 5a
clear all; close all

opts = bodeoptions;
opts.Grid='on'

figure;
% constante
H=tf([0.6],[1])
bode(H,opts)
hold on
% polo em s=-1
H=tf([1],[1 1]);
bode(H,opts)
hold on
% polo em s=-3
H=tf([1],[1/3 1]);
bode(H,opts)
hold on

Ht=tf([6],[1 11 10]); %total
bode(Ht,opts)
legend('Constante','Pólo em s=-1','Pólo em s=-3','Total')

h = findobj(gcf,'type','line');
set(h,'linewidth',2);
```



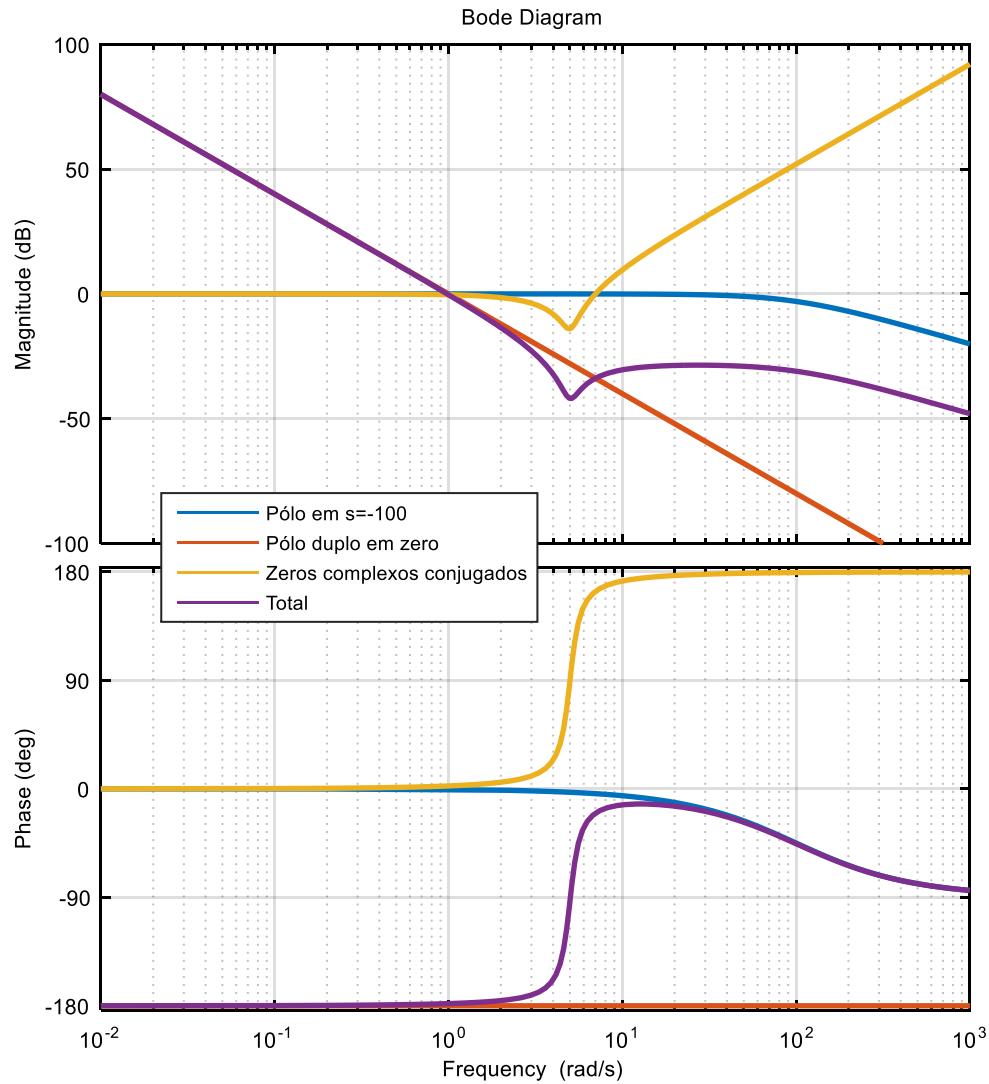
```
%% Exercício 5b
clear all; close all

opts = bodeoptions;
opts.Grid='on'

figure;
% polo na origem+constante
H=tf([100/3],[1 0])
bode(H,opts)
hold on
% polo em s=-3
H=tf([1],[1/3 1]);
bode(H,opts)
hold on
% zero em s=-10
H=tf([1/10 1],[1]);
bode(H,opts)
hold on
% final
Ht=tf([10 100],[1 3 0]); %total
bode(Ht,opts)

legend('Constante+Pólo na origem','Pólo em s=-3','Zero em s=-10','Total')

h = findobj(gcf,'type','line');
set(h,'linewidth',2);
```



```

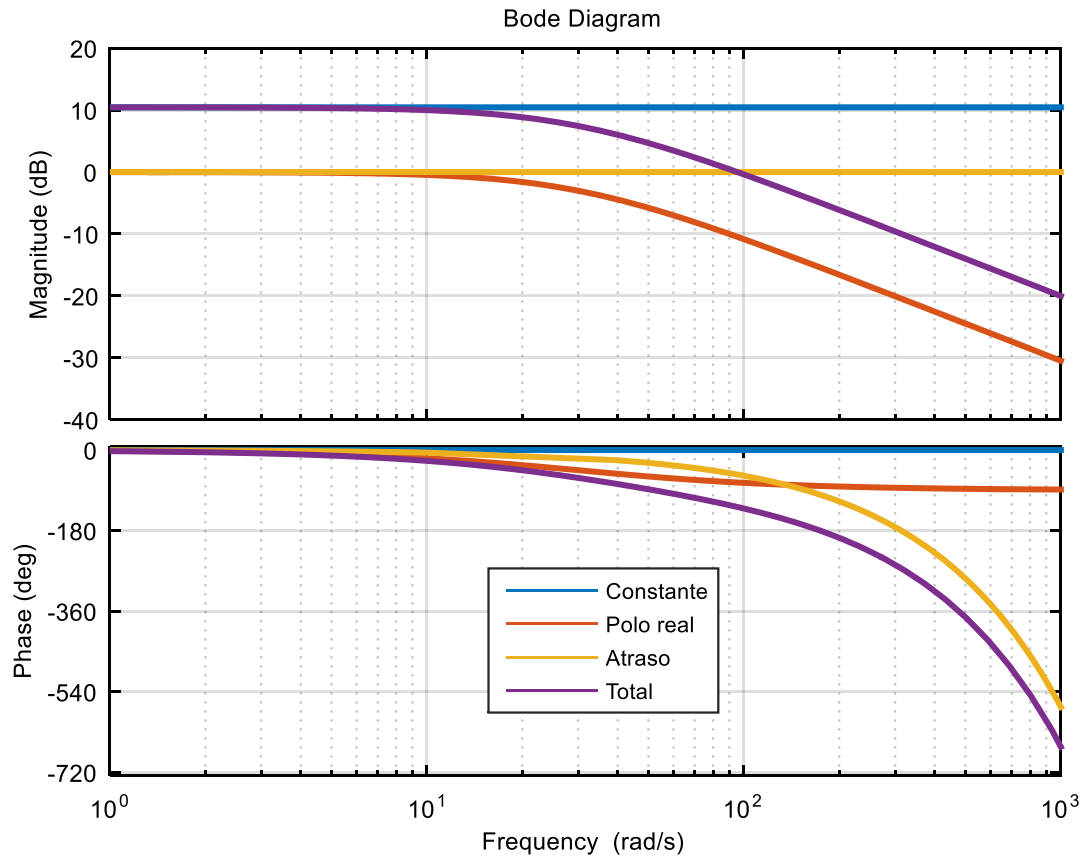
%% Exercício 5c
clear all; close all

opts = bodeoptions;
opts.Grid='on';
opts.Xlim = {[0.01,1000]};
opts.XlimMode = {'manual'};
figure;
% polo em s=-100
H=tf([1],[1/100 1]);
bode(H,opts)
hold on
% polo duplo na origem
H=tf([1],[1 0 0]);
bode(H,opts)
hold on
%zeros conjugados complexos
Ht=tf([1/25 1/25 1],[1]); %total
bode(Ht,opts)
hold on

%total
Ht=tf([4 4 100],[1 100 0 0]); %total
bode(Ht,opts)

legend('Pólo em s=-100','Pólo duplo em zero','Zeros complexos conjugados','Total')
h = findobj(gcf,'type','line');
set(h,'linewidth',2);

```



```

%% Ejercicio 5d
clear all; close all
figure;
opts = bodeoptions;
opts.PhaseMatching='on'

opts.Grid='on'
sys1=tf(10/3,[1])           % sys1 = constante = 10/3
sys2=tf(1,[1/30 1])         % sys2 = polo real = 1/(s + 30)
sys3=tf(1,1,'iodelay',0.01) % sys3 = retardo de 0.01s
sys4=tf([100],[1 30],'iodelay',0.01) % sys4 = total
bode(sys1,opts); hold on
bode(sys2,opts); hold on
bode(sys3,opts); hold on
bode(sys4,opts);

legend('Constante','Polo real','Atraso','Total')

h = findobj(gcf,'type','line');
set(h,'linewidth',2);

```