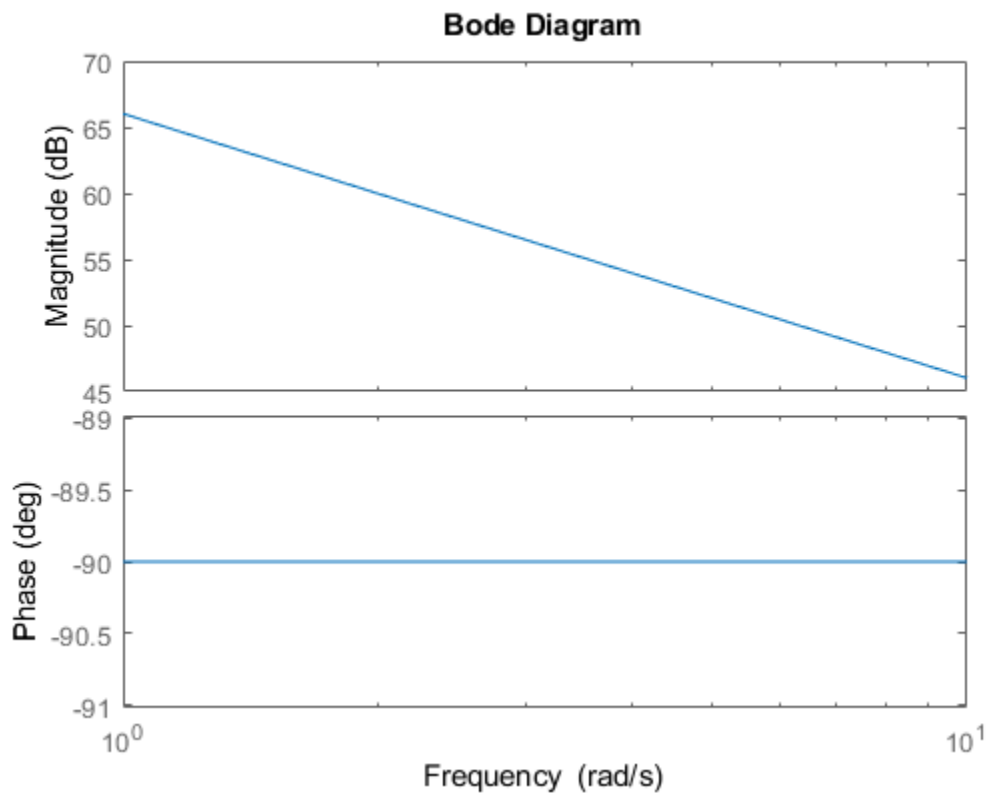

Table of Contents

Problem 1	1
Problem 2	3
First part	4
Second part --- phase approximation	5
homework	6

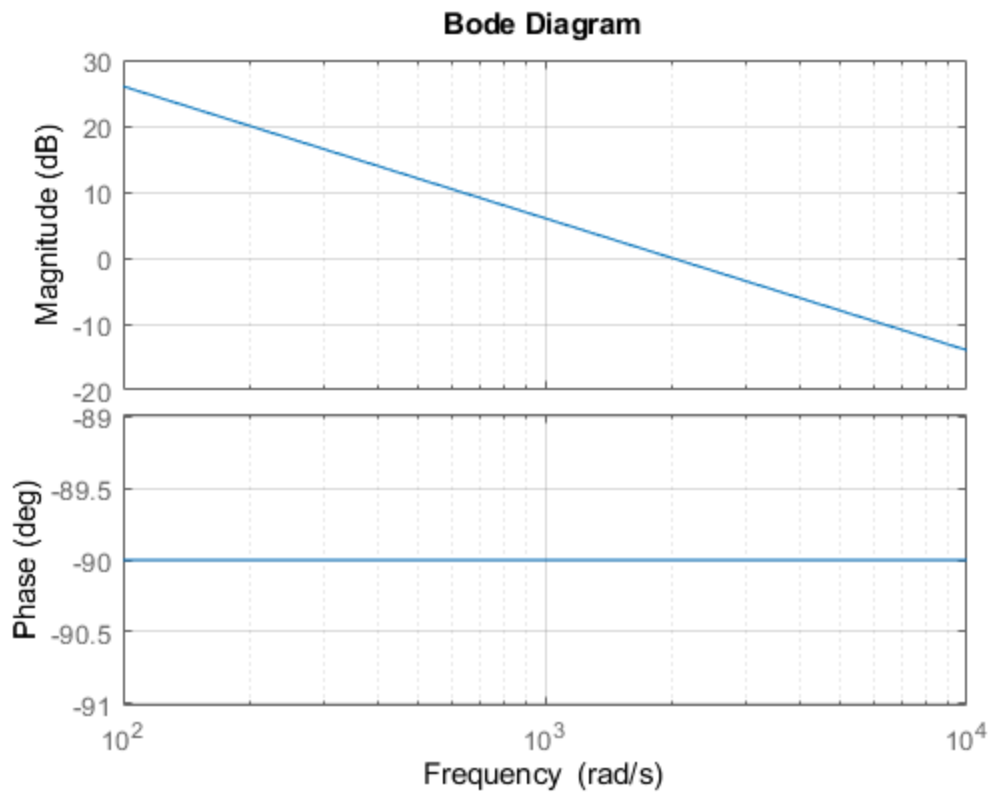
Problem 1

```
H = tf(2e3,[1 0]);  
bode(H)
```



First part

```
w = logspace(2,4,5e2);  
% We use logspace to zoom on a specific area  
% First parameter is from where we want to zoom until the second parameter  
% ( how many decades )  
% The third parameter means how many points we want to take  
bode(H,w);  
grid; shg
```



Second part)

```
clc
[m, f] = bode(H, w);
mv = squeeze(m); % facem in vector coloana
fv = squeeze(f);

%-----For magnitude-----
subplot(211);
semilogx(w, 20*log10(mv), 'LineWidth', 2) % 10 decades

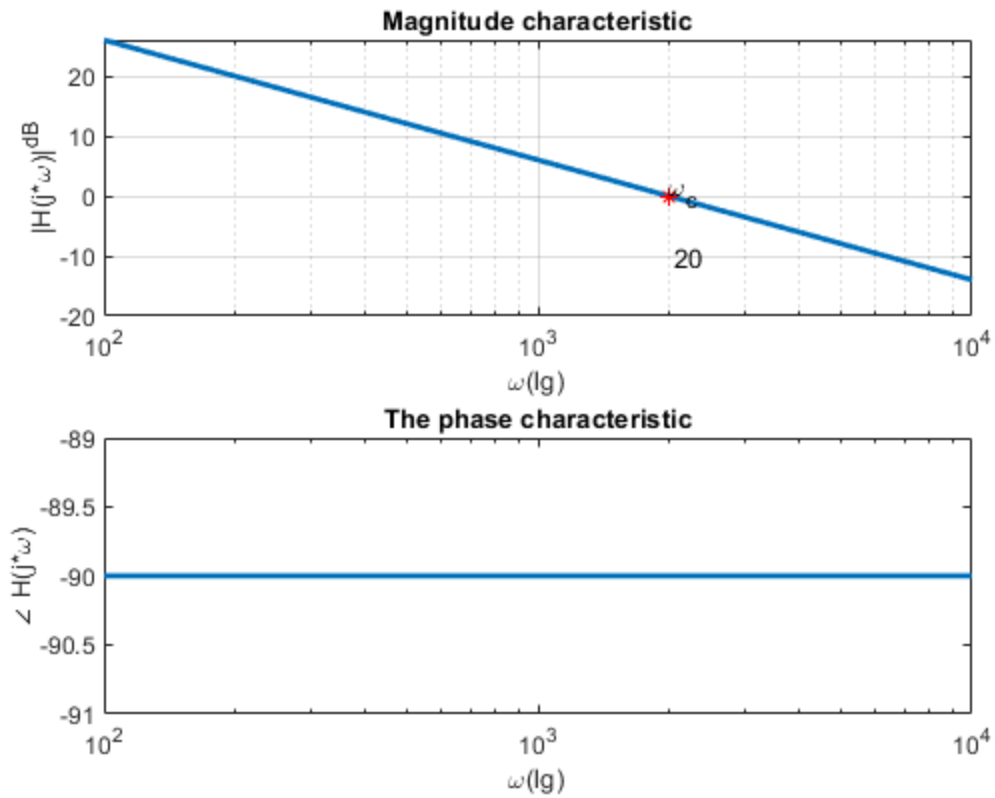
title('Magnitude characteristic');
xlabel('\omega(lg)')
ylabel('|H(j*\omega)|^{dB}')
grid
hold
semilogx(2e3, 0, '*r');
text(2e3, 1, '\omega_c');
text(2e3+50, -10, '20');

%-----For phase-----
subplot(212)
semilogx(w, fv, 'LineWidth', 2);
shg

xlabel('\omega(lg)')
```

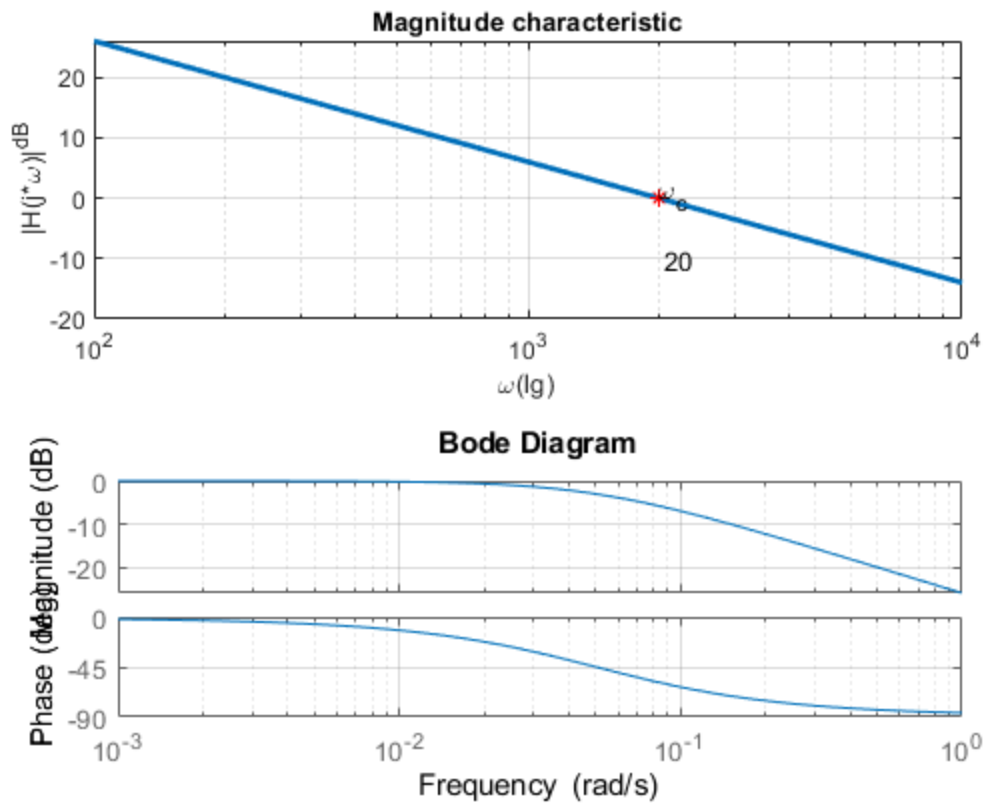
```
ylabel('\angle H(j*\omega)')
title('The phase characteristic')
```

Current plot held



Problem 2

```
clc
T = 1 / (5e-2); % time constant
H2 = tf(1,[T 1]);
bode(H2)
shg; grid
```



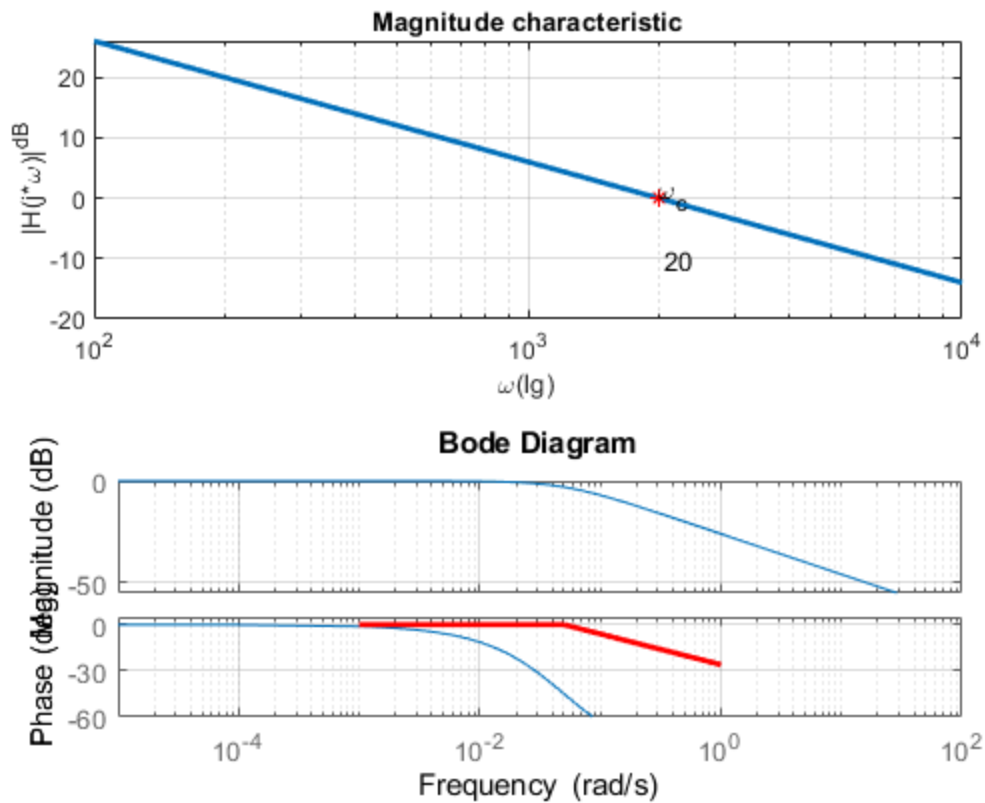
First part

Approximate by asymptotes the magnitude (Foe) --- we draw the asymptotes

```
clc
hold;
semilogx([1e-3,5e-2], [0 0], 'r-', 'LineWidth', 2)
semilogx([5e-2,5e-1,1], [0,-20,-26], 'r-', 'LineWidth', 2)
hold
axis([1e-5,1e2,-60,5]);
shg
```

Current plot held

Current plot released

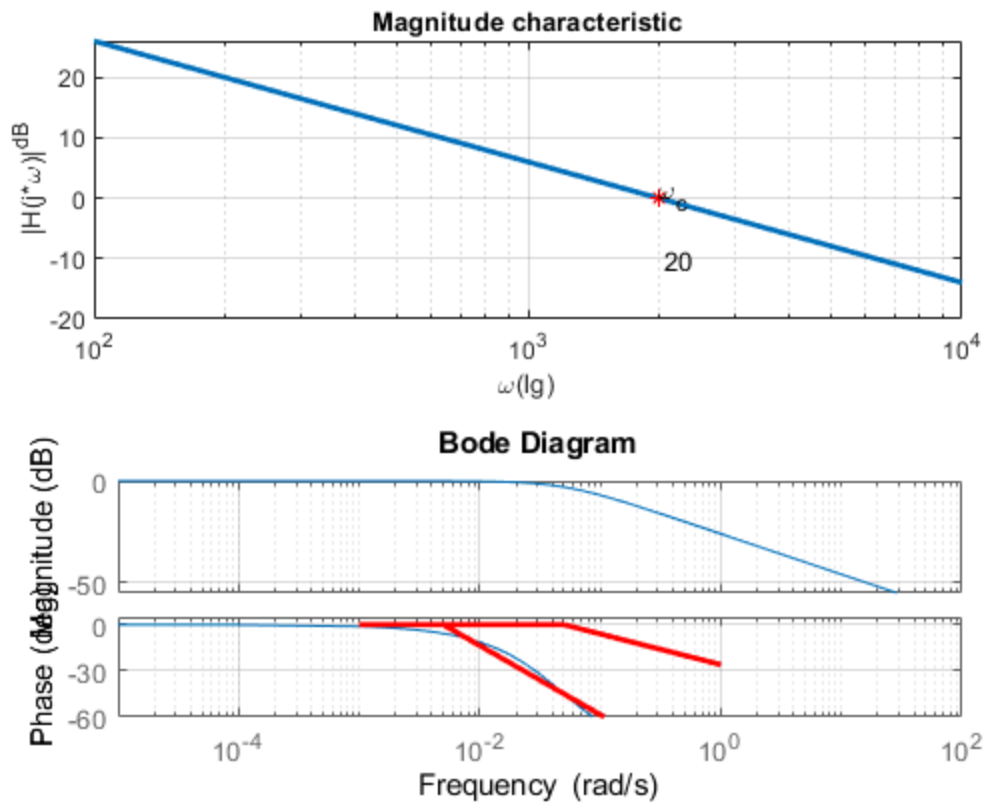


Second part --- phase approximation

```
hold;
semilogx([1e-3, 5e-3],[0 0], 'r-', 'LineWidth', 2)
semilogx([5e-3, 5e-2, 5e-1, 1],[0, -45, -90, -90], 'r-', 'LineWidth', 2)
hold;
shg;
```

```
%fisier function Bode(k,T) si sa traseze prin asimptote
% k = ? a.i sa inceapa de la 6
```

```
Current plot held
Current plot released
```



homework

for $k = 2$ we can start from 6 on the y axis

```
clc
wco = 5e-2;
T = 1/wco;
k = 1;
FOEB(k,T);

figure
bode(k,[T 1])
hold;
semilogx([1e-3, 5e-3],[0 0],'r-','LineWidth',2)
semilogx([5e-3,5e-2,5e-1,1],[0,-45,-90,-90],'r-','LineWidth',2)
hold;
shg;

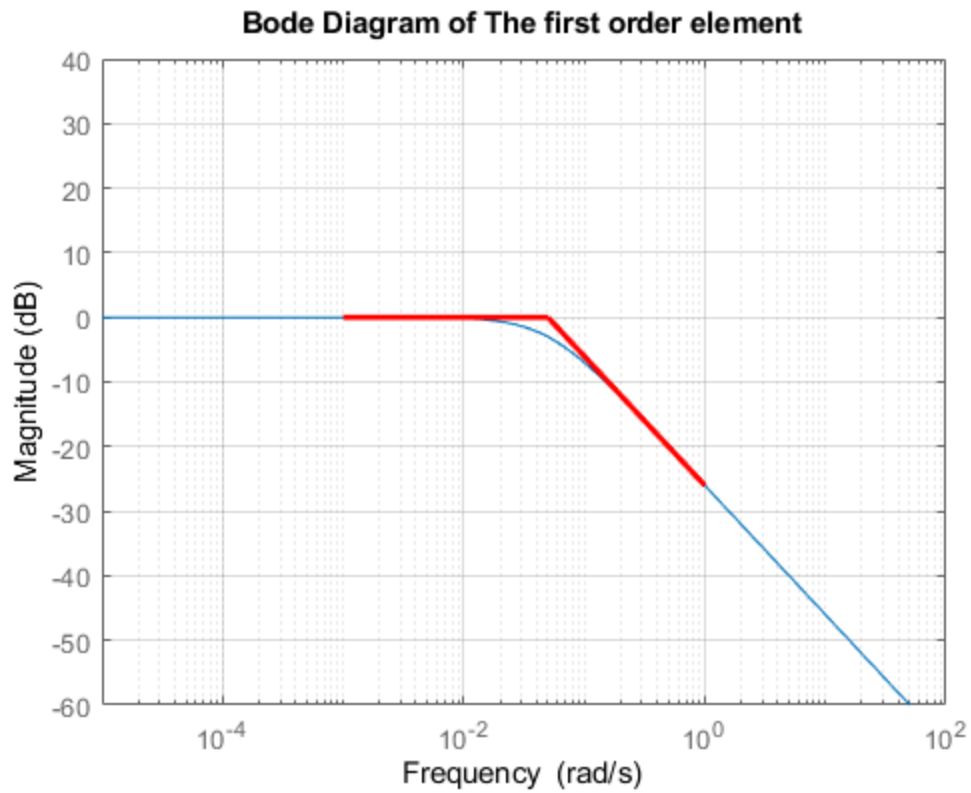
function f = FOEB(k,T)
    H = tf(k, [T,1]);
    figure
    bodemag(H);
    title('Bode Diagram of The first order element');
    grid;shg;
    hold
```

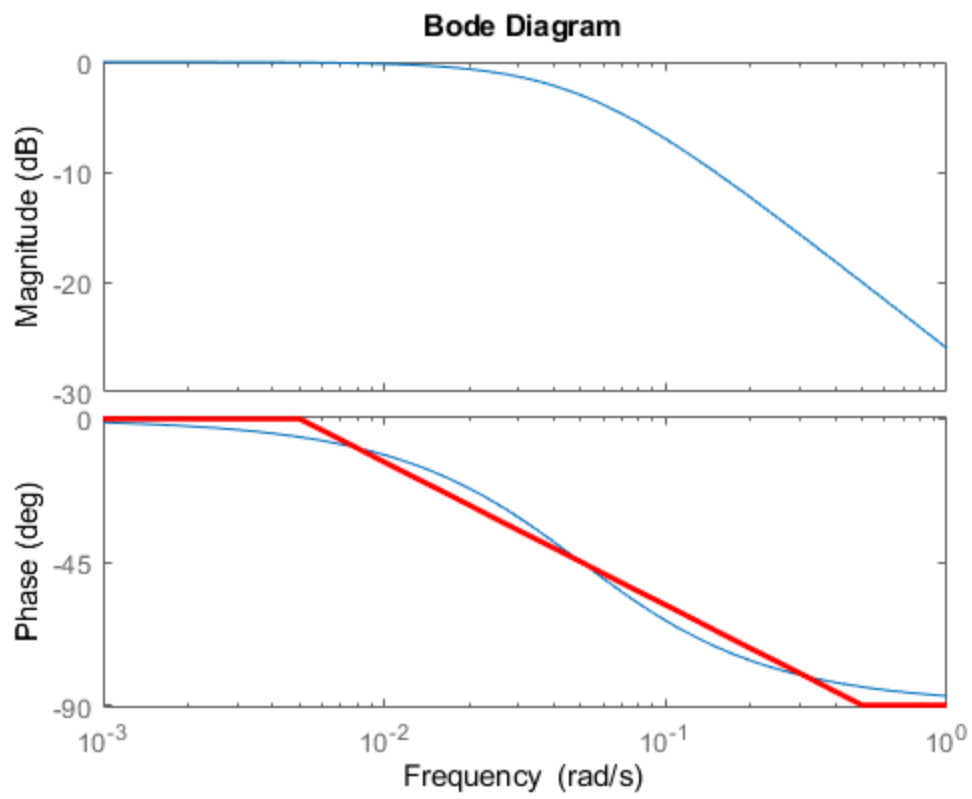
```

    semilogx([1e-3,5e-2], [20*log10(k) 20*log10(k)], 'r-', 'LineWidth', 2)
    semilogx([5e-2,k*5e-1,1],[20*log10(k),-20,
(20*log10(k)+20*log10(5e-2))], 'r-', 'LineWidth', 2)
    axis([1e-5,1e2,-60,40]);
end

```

Current plot held
Current plot held
Current plot released





Published with MATLAB® R2022b