

# Praktikum – Regelungstechnik – Versuch 1

## Aufgabe 1

A =

```
2 1 3
-1 2 -1
1 2 3
```

```
>> b=[3 ; -3 ; 3 ]
```

b =

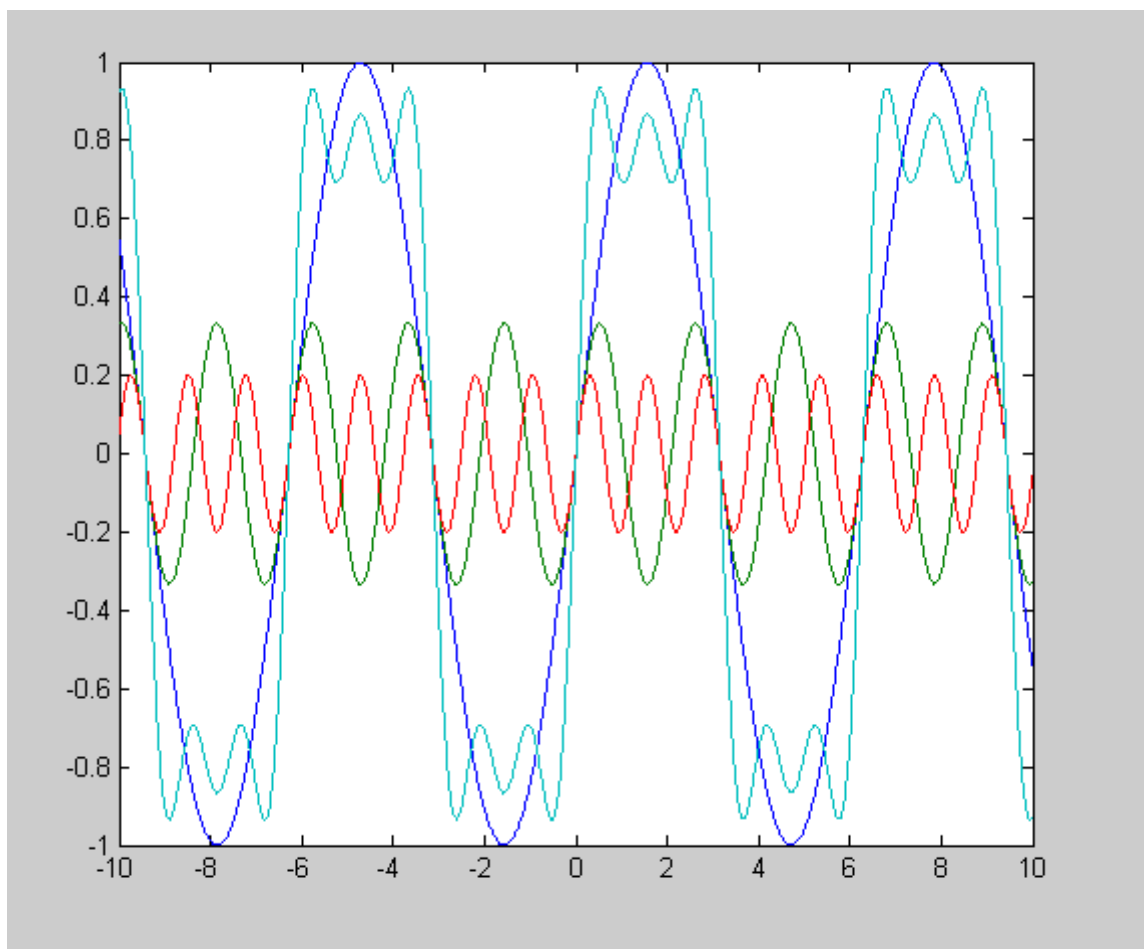
```
3
-3
3
```

```
>> x = A \ b
```

x =

```
-1.0000
-1.0000
2.0000
```

## Aufgabe 2



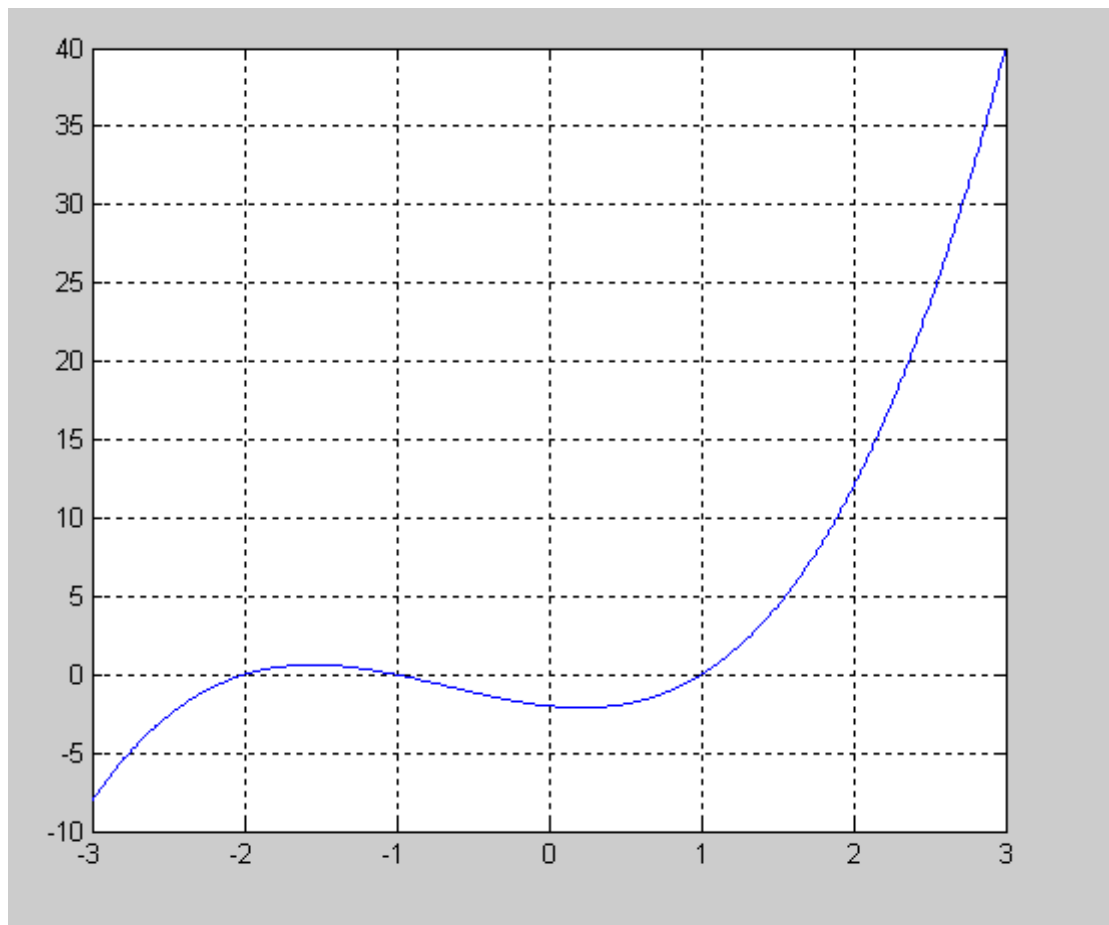
### Aufgabe 3

```
p1=[1 3 2]
p2 = [1 -1]
p3=conv(p1,p2)
x=-3:0.01:3
```

```
p3 =
    1     2    -1    -2
```

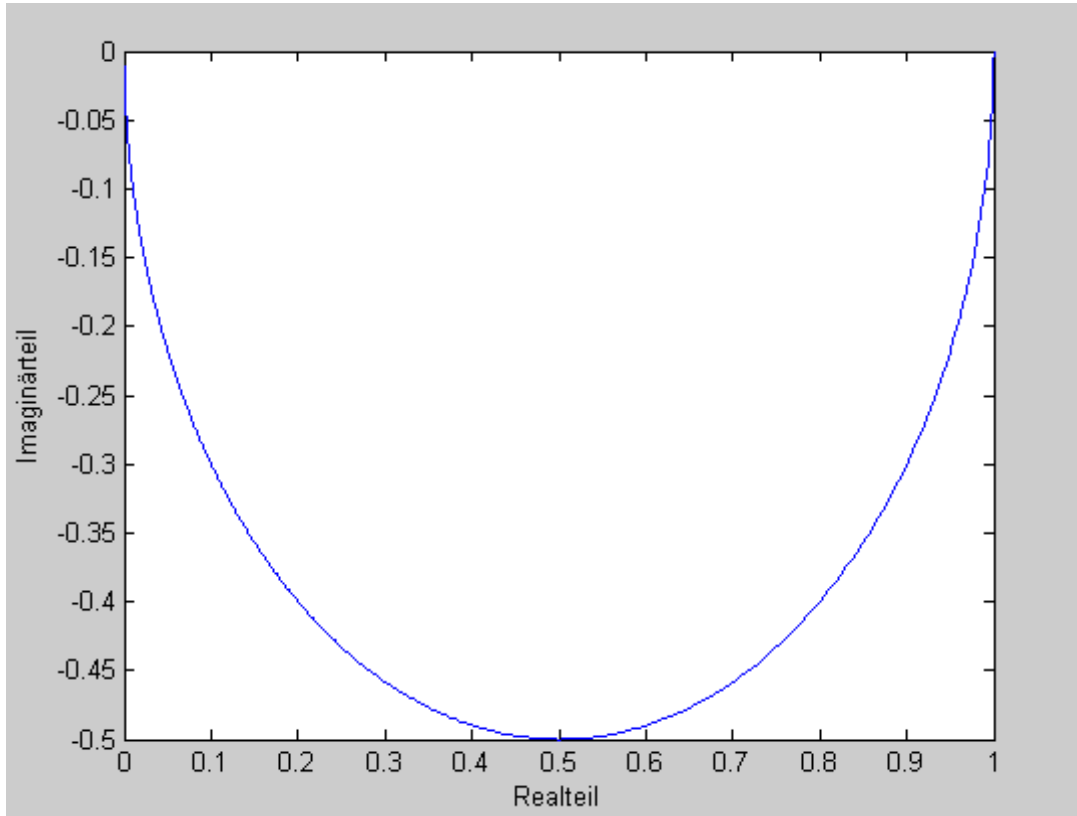
```
>> plot(x,polyval(p3,x))
>> grid
```

```
>> roots(p3)
ans =
    1.0000
   -2.0000
   -1.0000
```



#### Aufgabe 4:

```
f = 1 ./ (i * w + 1)  
plot(f)  
xlabel('Realteil')  
ylabel('Imaginärteil')
```



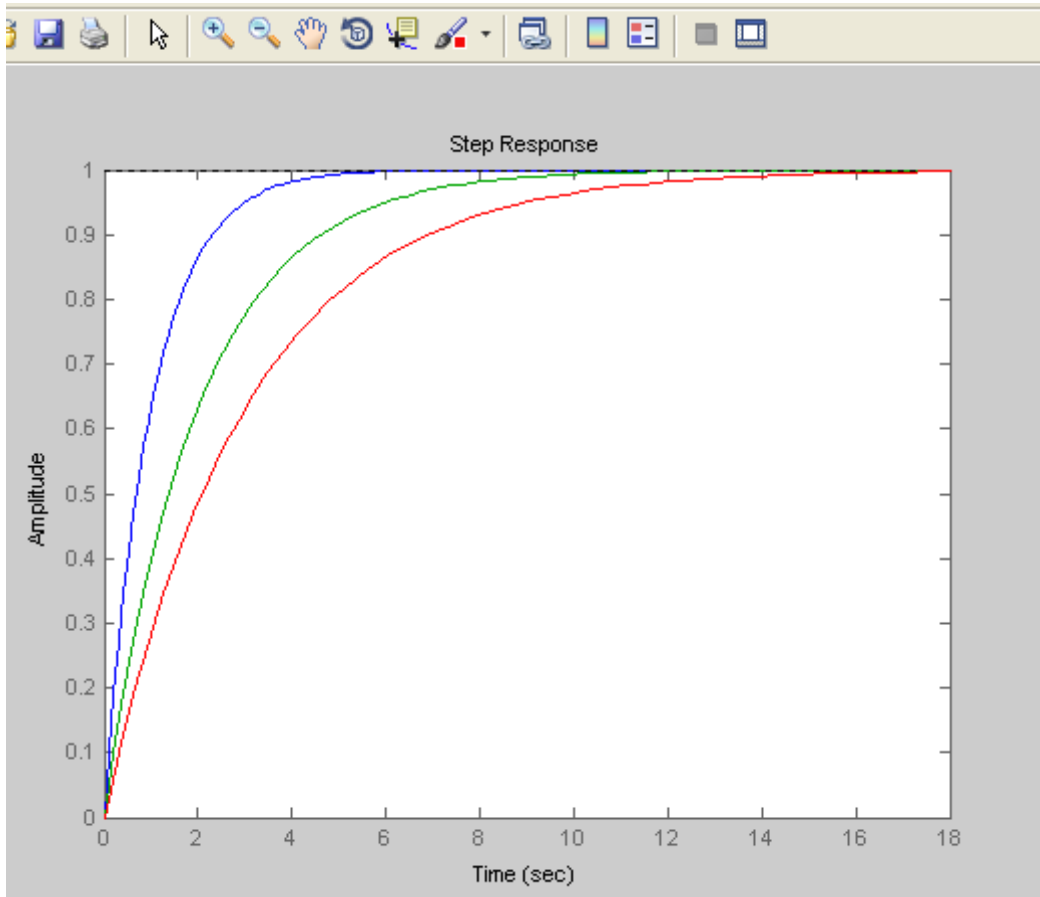
### Aufgabe 1.5.1

F1 = tf(1, [1 1])

F2 = tf(1, [2 1])

F3 = tf(1, [3 1])

step(F1,F2,F3)



## Aufgabe 1.5.2

$$w_0 = 1$$

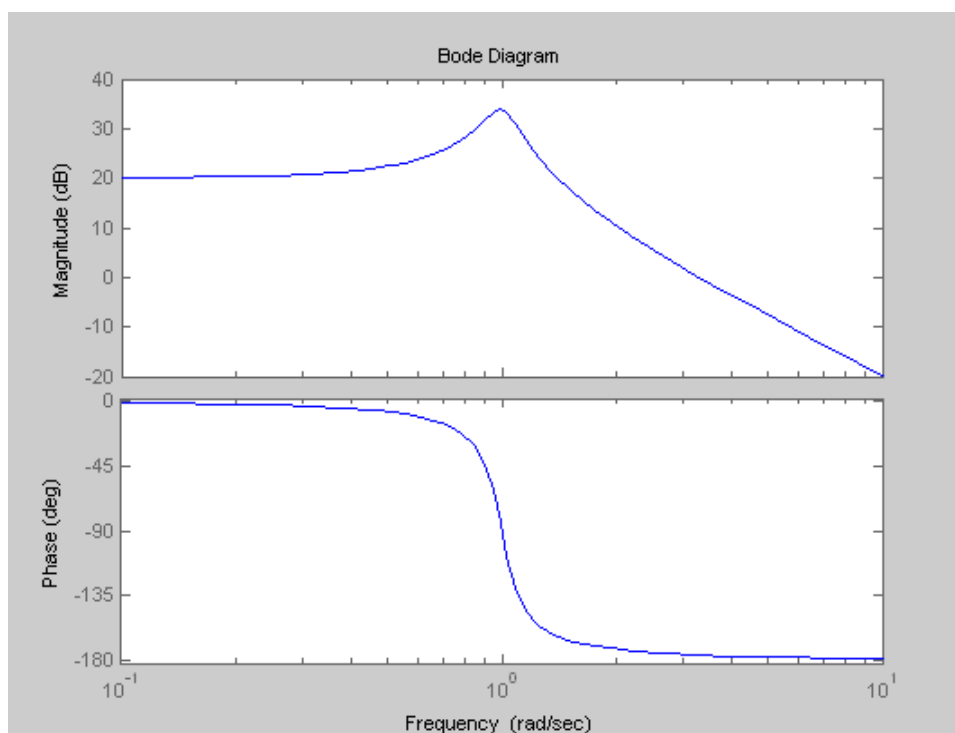
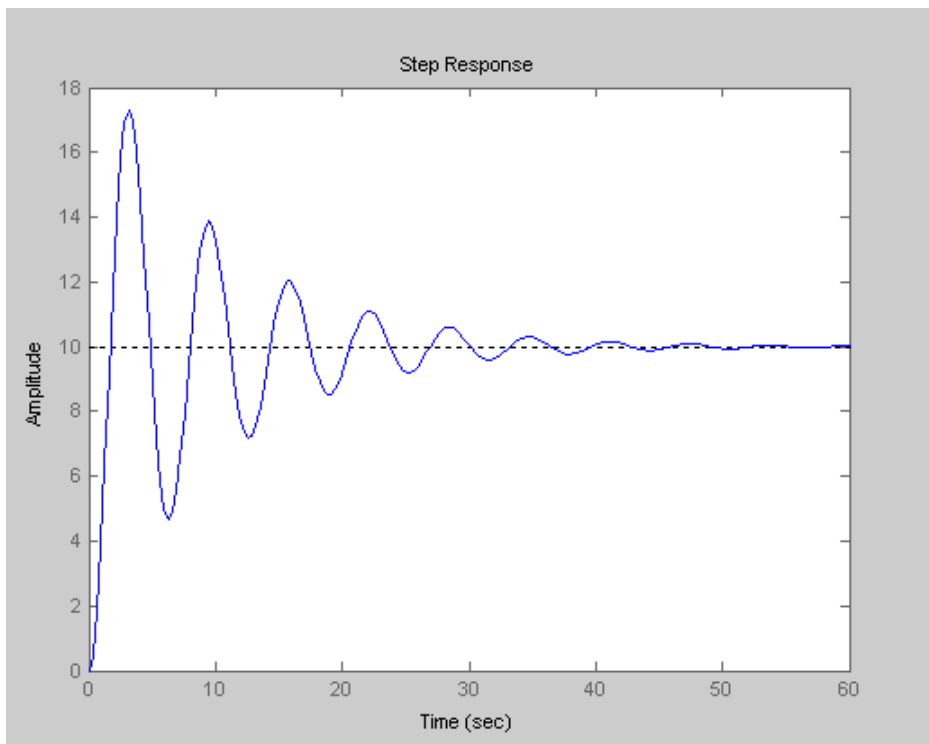
$$F1 = tf(10*w_0^2, [1 \ 2*0.1*w_0 \ w_0^2])$$

$$F2 = tf(10*w_0^2, [1 \ 2*0.7*w_0 \ w_0^2])$$

$$F3 = tf(10*w_0^2, [1 \ 2*2*w_0 \ w_0^2])$$

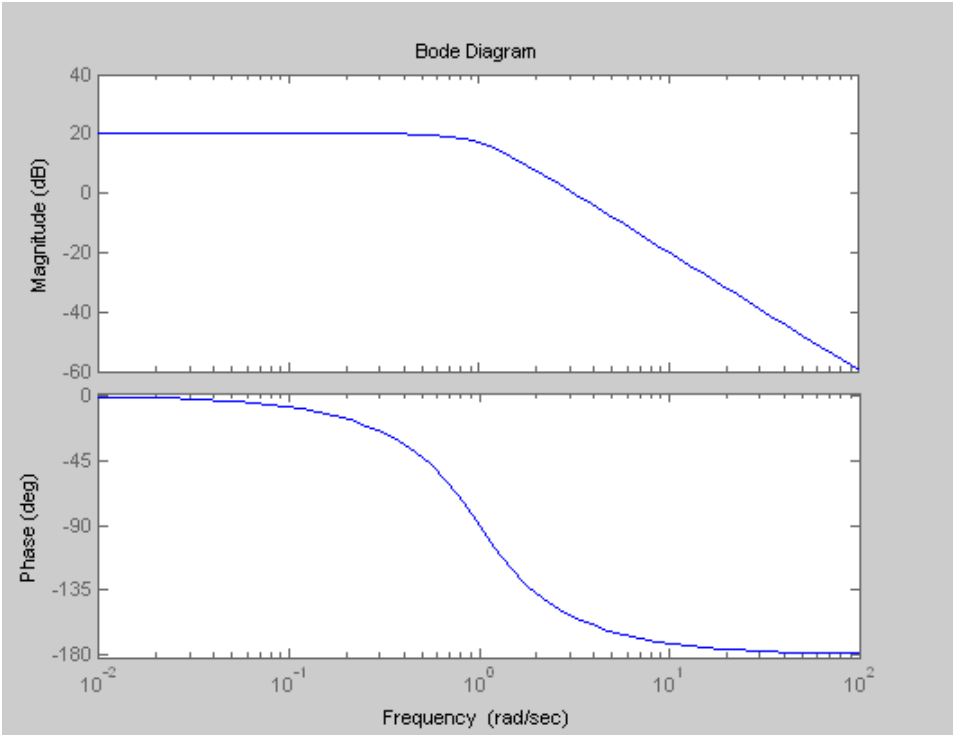
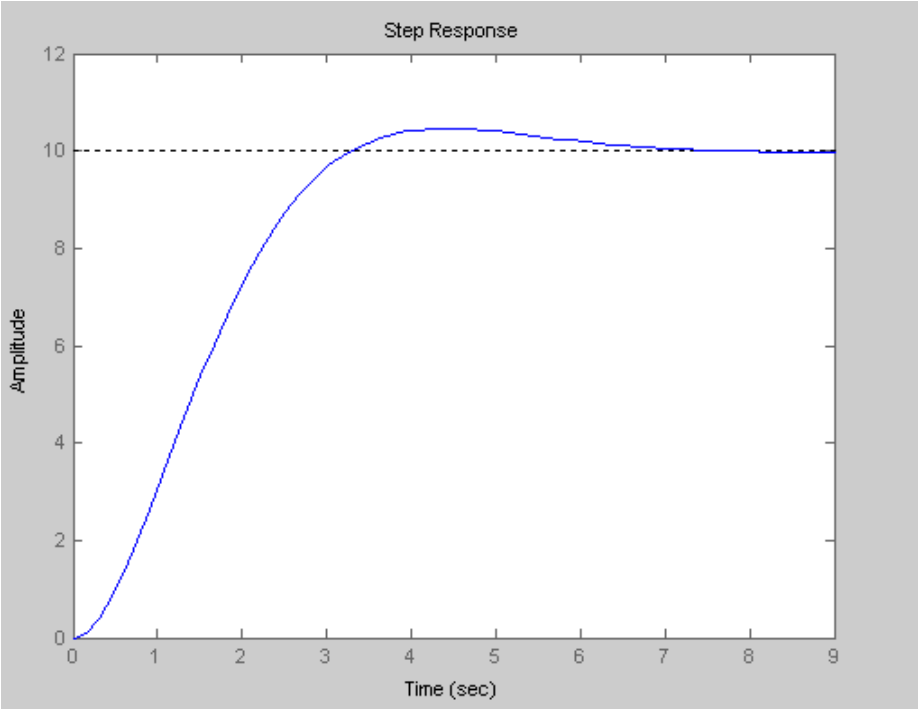
step(F1)

bode(F1)

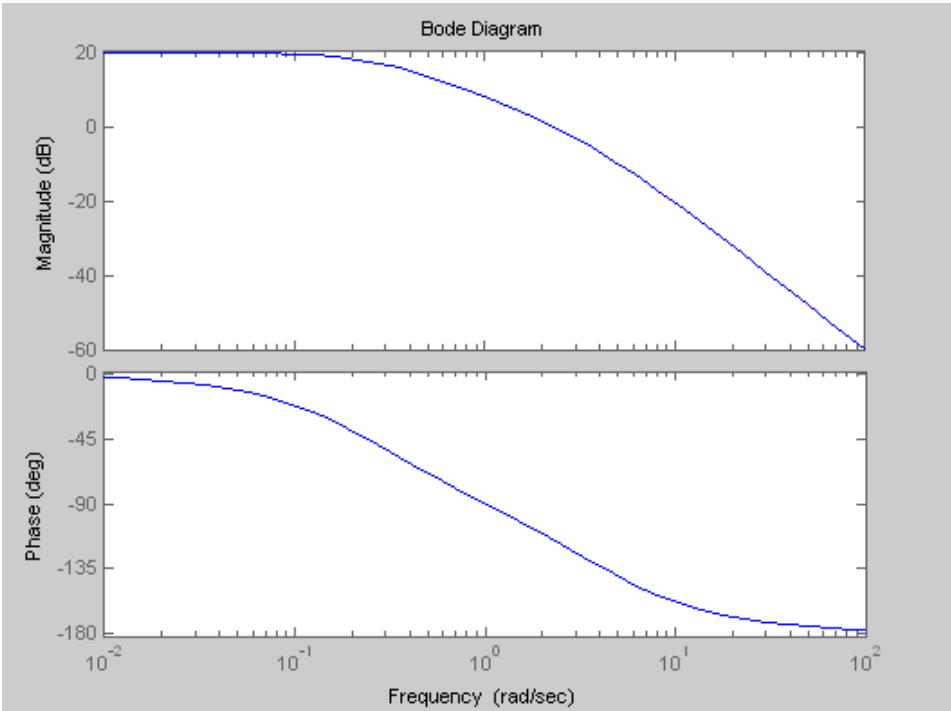
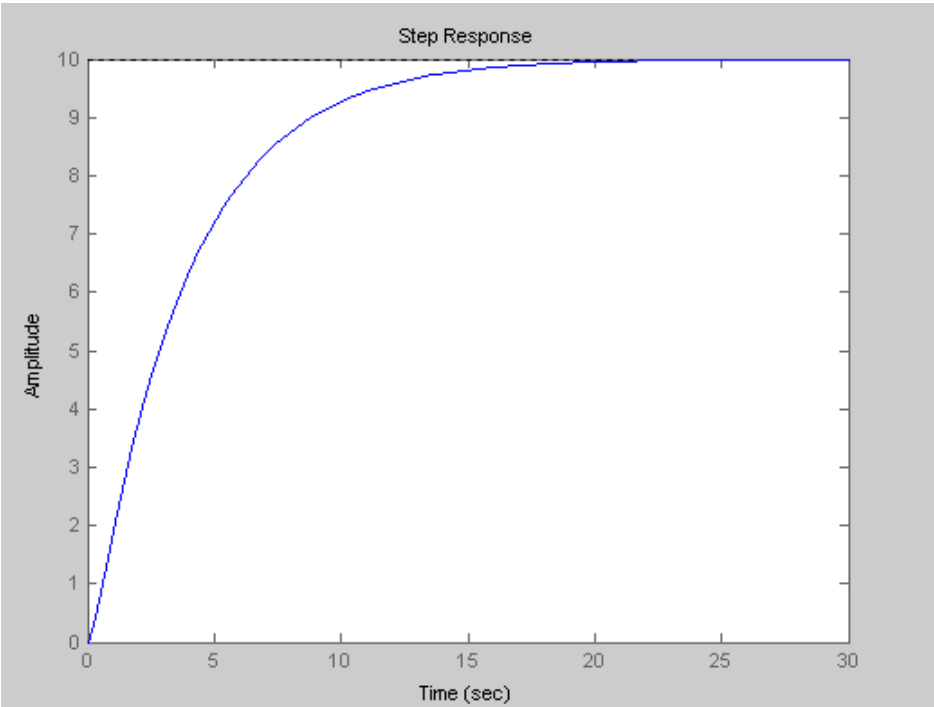


```
step(F2)
```

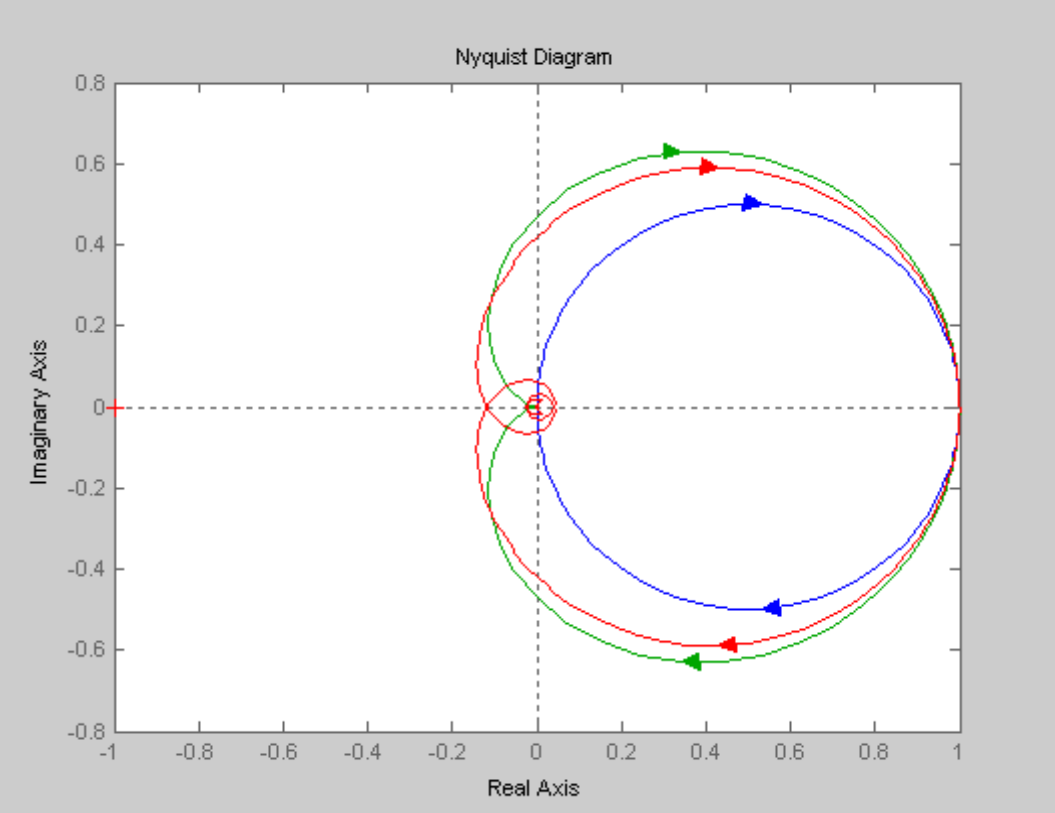
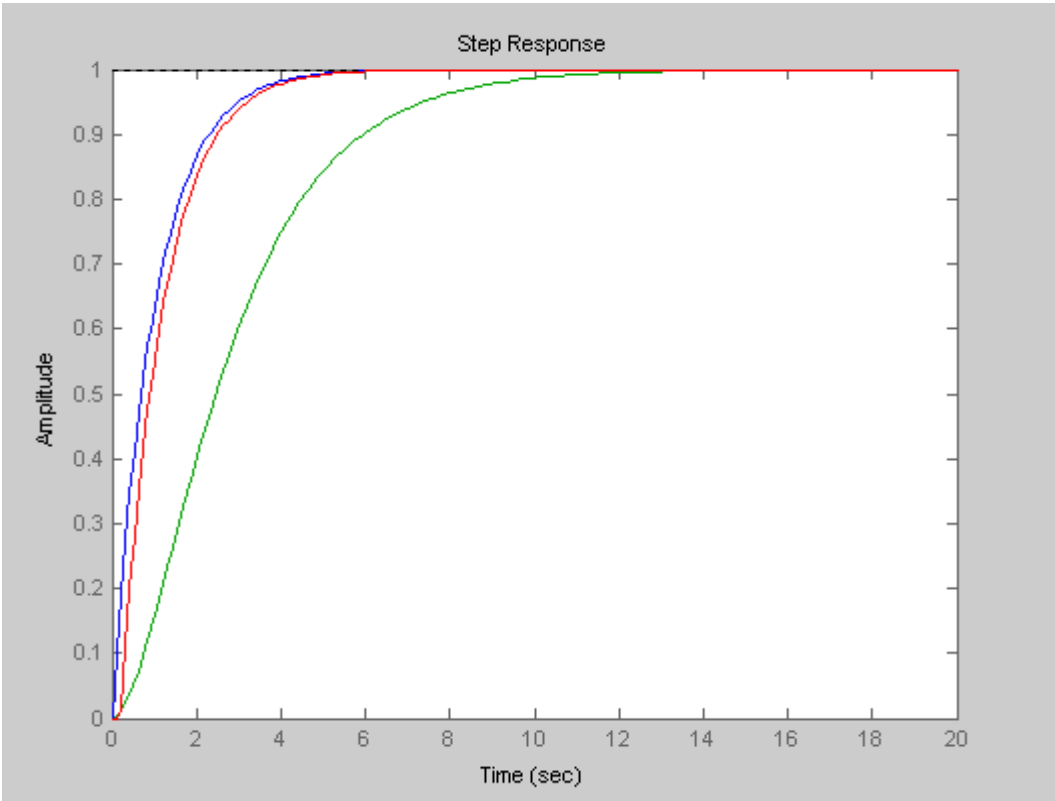
```
bode(F2)
```



step(F3)  
bode (F3)

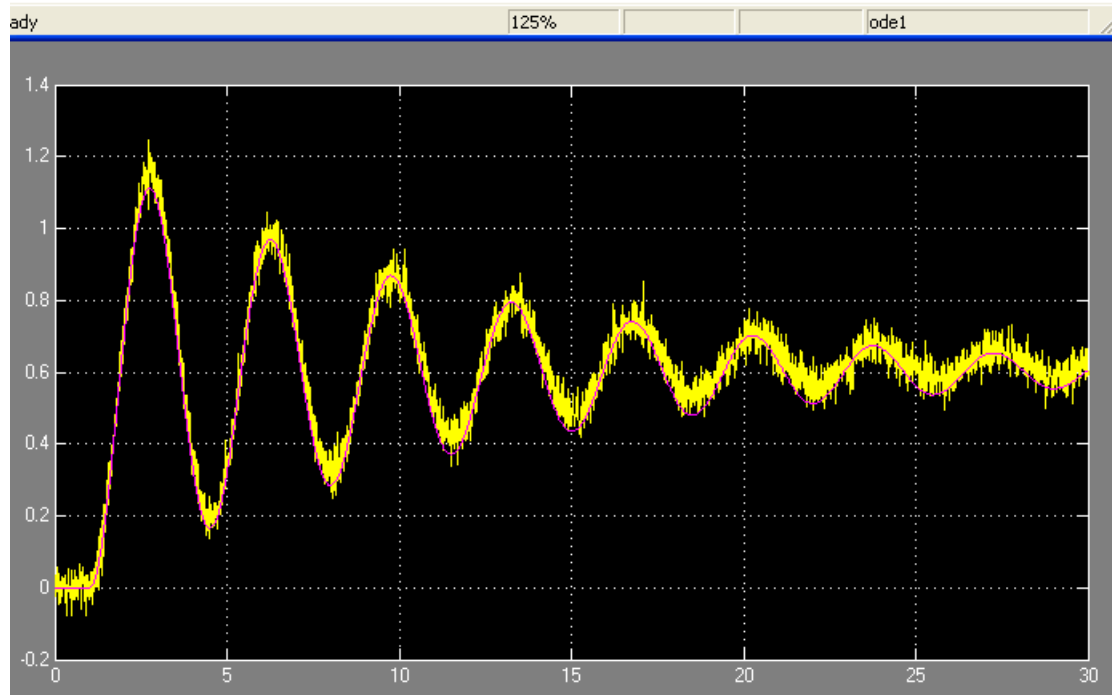
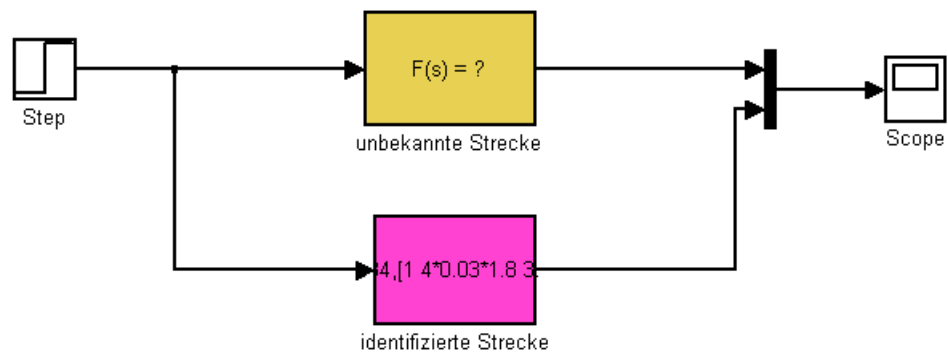


**Aufgabe 1.5.3**





## Aufgabe 1.5.4



schwingungsfähiges PT2 System

$T =$

3.5000

$\gg w_0 = 2 \cdot \pi / T$

$w_0 =$

1.7952

$\gg D = 1 / (2 \cdot \pi) \cdot \log(0.6 / 0.4)$

$D =$

0.063

$\gg K_s = 0.6$

$K_s =$

0.6000

$\gg F = \text{tf}(K_s \cdot w_0^2, [1 \ 2 \cdot D \cdot w_0 \ w_0^2])$

Transfer function:

1.934

-----  
 $s^2 + 0.1042 s + 3.223$