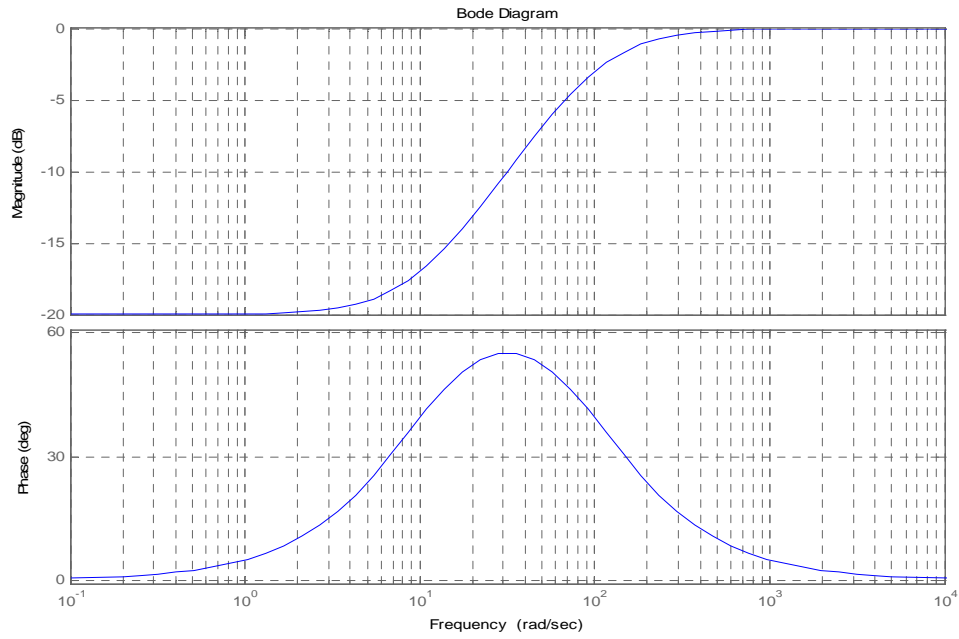


# Questions

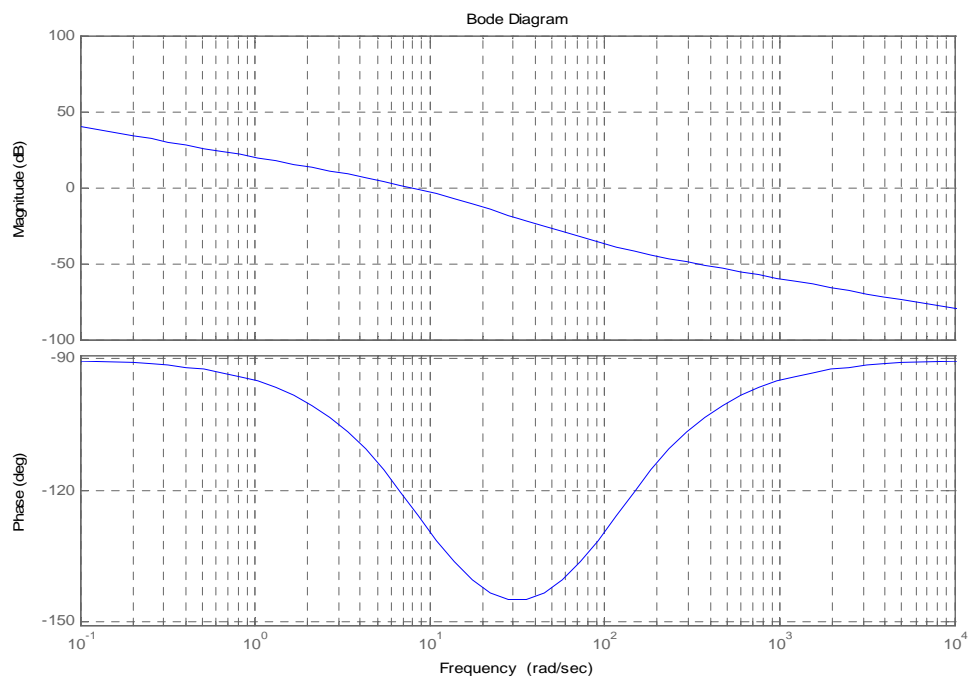
## Bode plots – Determining Transfer Function

1. Determine the transfer function for the following Bode plots.

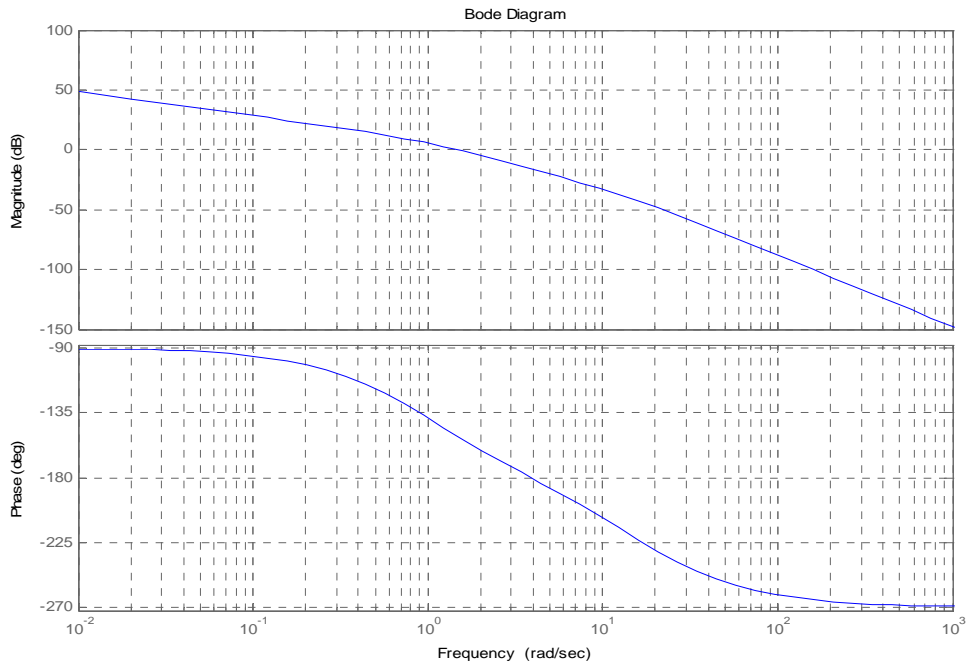
a



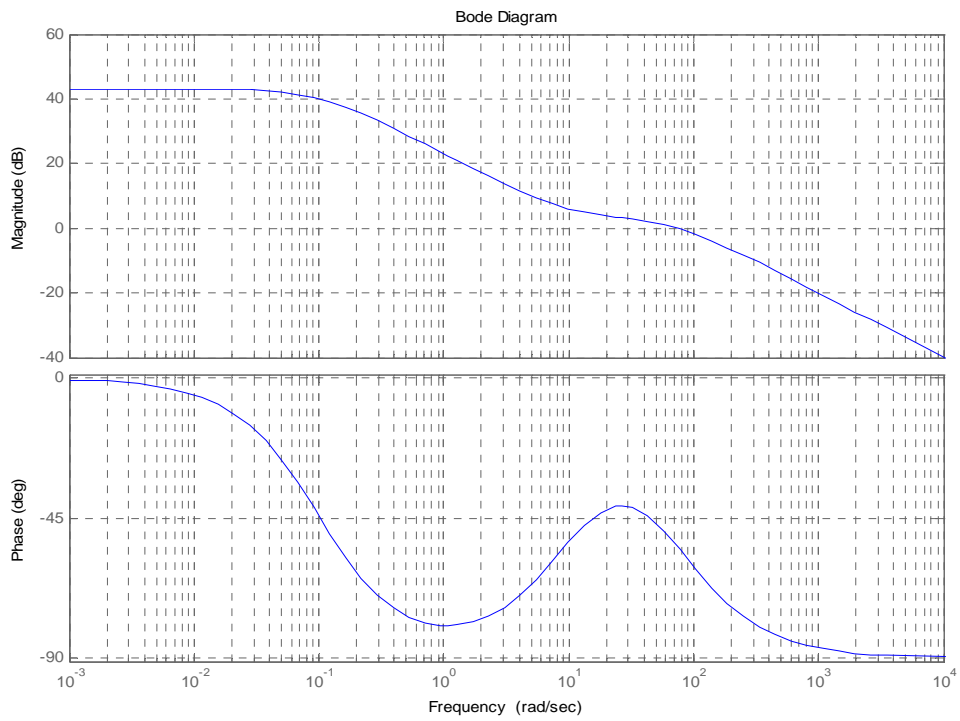
b)



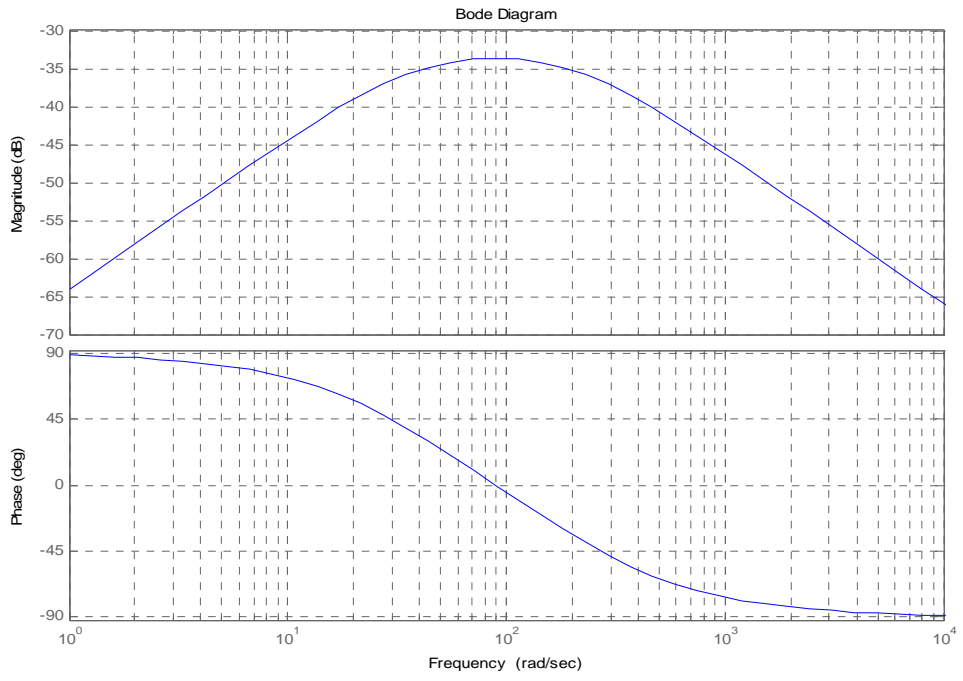
c)



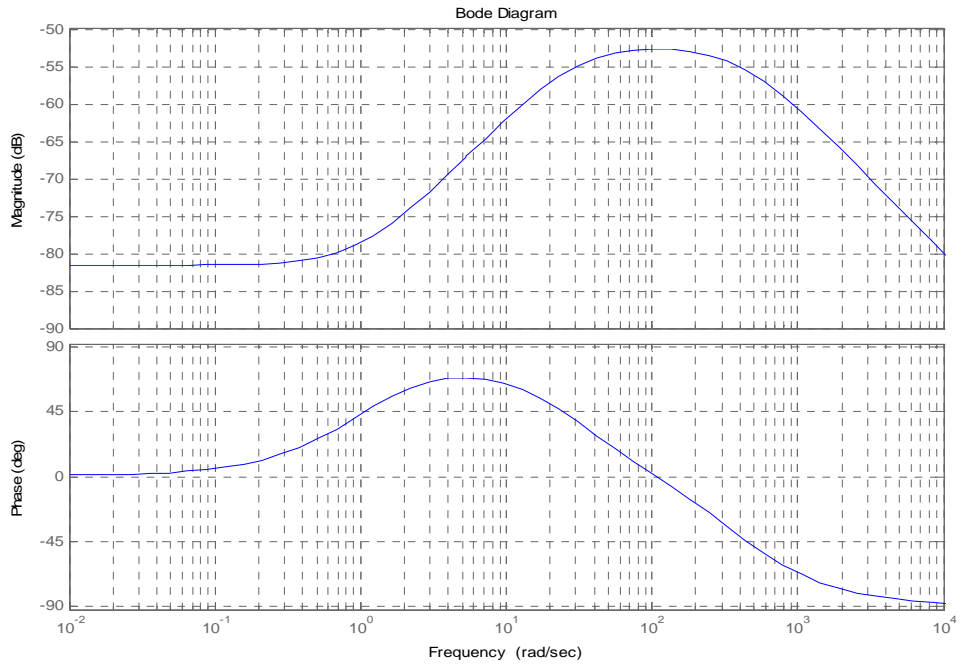
d)



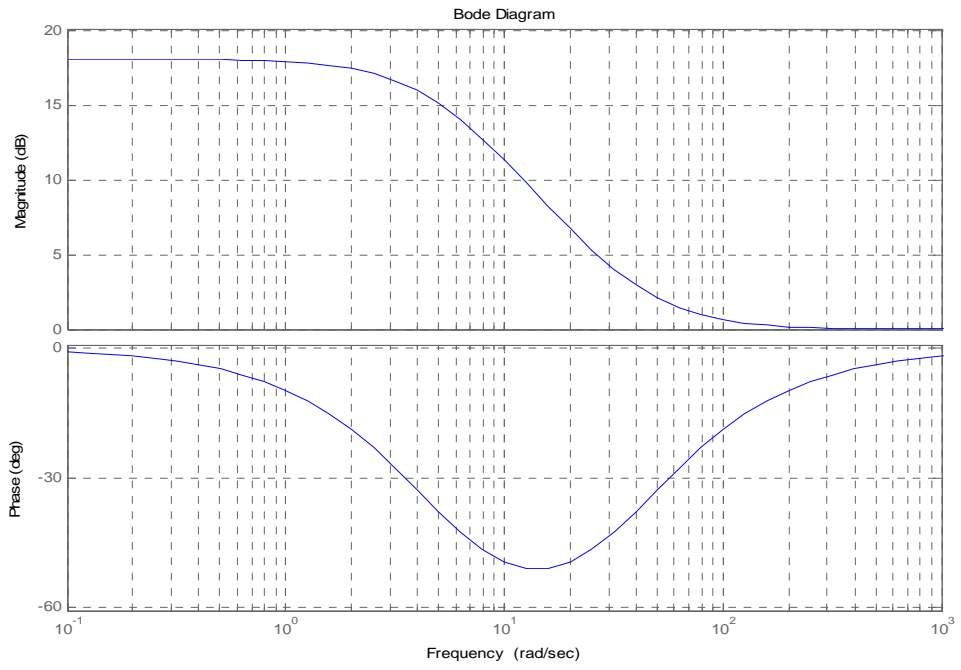
e)



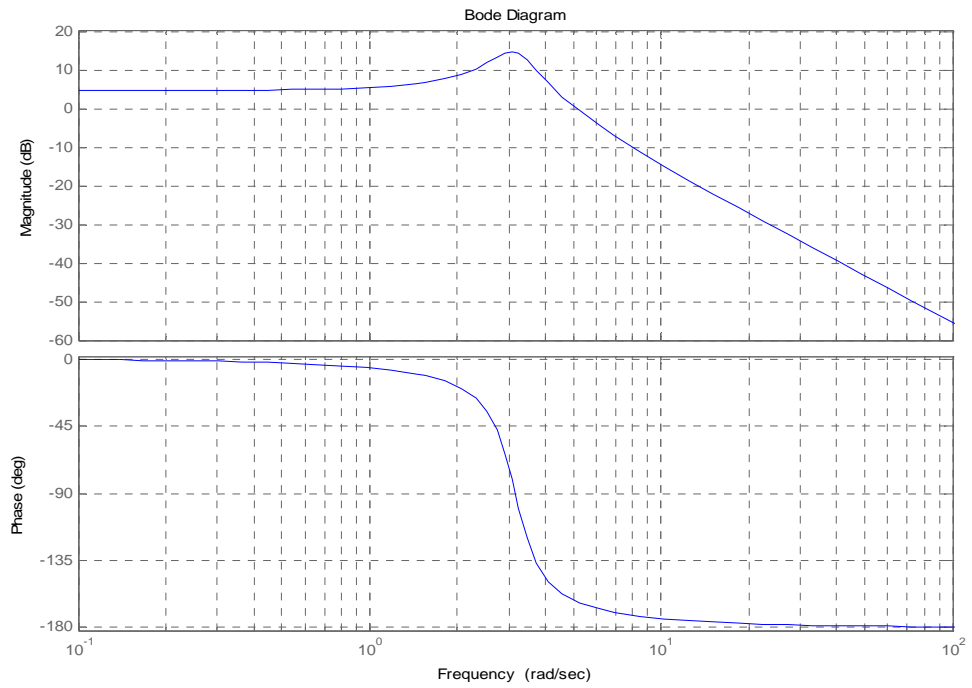
f)



g)



h)



Answers :

- a) Transfer function: 
$$\frac{s + 10}{s + 100}$$
 DC-Gain= 1/10  
break frequencies: 10 and 100 rad/sec
- b) Transfer function: 
$$\frac{s + 100}{s^2 + 10 s}$$
 Integration, DC-gain= Inf  
break frequencies: 100 and 10 rad/sec
- c) Transfer function: 
$$\frac{40}{s^3 + 16 s^2 + 15 s}$$
 Integration, DC-gain = Inf  
break frequencies: 1 and 15 rad/sec
- d) Transfer function: 
$$\frac{100 s + 1000}{s^2 + 70.1 s + 7}$$
 DC-gain=1000/7  
break frequencies: 0.1, 10 and 70 rad/sec
- e) Transfer function: 
$$\frac{5 s}{s^2 + 240 s + 8000}$$
 Differentiation , DC-Gain: 0,  
Break frequencies: 40 and 200 rad/sec
- f) Transfer function: 
$$\frac{s + 1}{s^2 + 430 s + 12000}$$
 DC-gain= 1/ 12000  
Break frequencies: 30 and 400 rad/sec

g) Transfer function:

$$\frac{s + 40}{s + 5}$$

DC-gain = 8

Break frequencies: 5 and 40 rad/sec

h) Transfer function:

$$\frac{17}{s^2 + s + 10}$$

DC-gain = 17/10

Break frequencies: 1 rad/sec