Introductory Control Systems
Exercises #15 – Bode Magnitude Diagrams

For each of the transfer functions given below, ***sketch*** the approximate ***Bode magnitude diagram***. Identify all ***corner frequencies***. ***Estimate*** the frequency ranges over which this system ***amplifies*** and ***attenuates*** its input.

1. $G(s) = \dfrac{270\, s\,(s+10)}{(s+3)\left(s^2 + 40\text{s} + 900\right)}$

2. $G(s) = \dfrac{10\,(s+2)(s+50)}{s\left(s^2 + 15\text{s} + 100\right)}$

3. $G(s) = \dfrac{25\,(s+5)(s+20)}{s\left(s^2 + 70\text{s} + 2500\right)}$

4. $G(s) = \dfrac{6310\,(s+3)}{(s+60)\left(s^2 + 15\text{s} + 100\right)}$

5. $G(s) = \dfrac{1820\,(s+10)}{(s+2)(s^2+50\text{s}+900)}$

6. $G(s) = \dfrac{1250(s+20)}{(s+100)(s^2+5\text{s}+25)}$

7. $G(s) = \dfrac{1186(s+2)}{(s+30)(s^2+4\text{s}+25)}$

8. $G(s) = \dfrac{7906\, s}{(s+10)\left(s^2 + 70\text{s} + 2500\right)}$