

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.

$$1. \quad G(s) = \frac{270 s (s+10)}{(s+3)(s^2 + 40s + 900)}$$

$$2. \quad G(s) = \frac{10 (s+2)(s+50)}{s(s^2 + 15s + 100)}$$

$$3. \quad G(s) = \frac{25 (s+5)(s+20)}{s(s^2 + 70s + 2500)}$$

$$4. \quad G(s) = \frac{6310 (s+3)}{(s+60)(s^2 + 15s + 100)}$$

$$5. \quad G(s) = \frac{1820(s+10)}{(s+2)(s^2+50s+900)}$$

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

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

$$8. \quad G(s) = \frac{7906 s}{(s+10)(s^2 + 70s + 2500)}$$