1) Find the voltage transfer function \( T(s) = \frac{V_o(s)}{V_i(s)} \) for the following two networks.
2. An amplifier frequency response is characterized by the transfer function $A(s)$ given by

$$A(s) = \frac{10^6s}{(s+10^3)(s+10^5)}$$

- Transform $A(s)$ to put it in the following form

$$A(s) = A_M F_L(s) F_H(s)$$

where $A_M$ is the midgap gain, $F_L(s)$ is the low frequency response with a generic form

$$F_L(s) = \frac{1}{1 + \frac{\omega_L}{s}}$$

and

$$F_H(s) = \frac{1}{1 + \frac{s}{\omega_H}}$$

- Find the midgap gain $A_M$, the low pole angular frequency $\omega_L$ in rad/s, and the high pole angular frequency $\omega_H$ in rad/s.

- Make a Bode plot of the magnitude of the gain in dB versus $\omega$ using a logarithmic scale for the $\omega$. Make sure to indicate the location of the low and high frequency poles. Use the Bode plot (Bode.pdf file) available on my UC website.

- Make a Bode plot of the phase of $A(s)$ versus $\omega$. Make sure to indicate the location of the low and high frequency poles.

- From your Bode plots, find the approximate magnitude of the gain and value of the phase of $A(s)$ at the angular frequency, $\omega = 10^5$ rad/s.
3. Construct the Bode plot of the phase shift versus angular frequency $\omega$ for the following low frequency behavior $F_L(s)$ function. Show the individual contribution of the phase shift due to each pole and zero as a dashed line, then show the total phase shift as a full line. Indicate on each segment of the total phase shift their slope (in degrees/decade). Make sure to put $F_L(s)$ in its canonical form first.

$$F_L(s) = \frac{s(s + 2)}{(s + 25)(s + 700)}.$$