

Problem #3

Write the transfer function $H(s) = V_o(s)/V_i(s)$ for the op-amp circuit shown given that the op-amp itself has the following transfer function:

$$A(s) = \frac{A_0}{1 + \frac{s}{\omega_0}} \quad (\text{NOTE: each op-amp has its unique values for } A_0 \text{ and } \omega_0. \text{ For the 741 op-amp } A_0 \approx 10^5 \text{ and } \omega_0 = 2\pi(10) \text{ rad/sec})$$

Show that the transfer function can be approximated as:

$$H(s) \approx \frac{1 + \frac{R_2}{R_1}}{1 + \frac{s}{\omega_{3dB}}} \quad \text{where } \omega_{3dB} = \frac{\omega_0 A_0}{1 + \frac{R_2}{R_1}}$$

