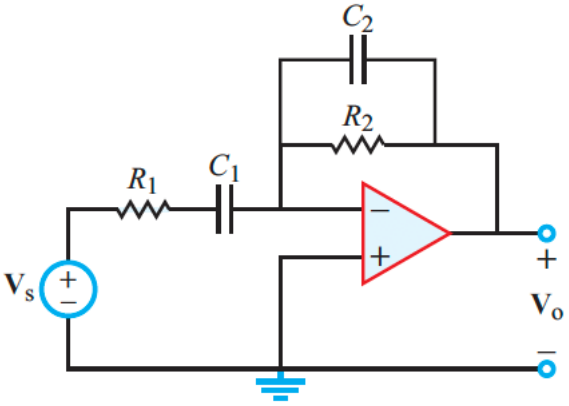
ECE 3337: Signals & Systems Analysis, Class Worksheet – Lecture 24

1. (60 points) For the following op-amp circuit,
   a. (20 points) derive an expression for the frequency response function $H(\omega) = \frac{V_o(\omega)}{V_s(\omega)}$.
   b. (20 points) Plot the magnitude of the frequency response function (gain) when $R_1 = 1k\Omega, R_2 = 20\Omega, C_1 = 5\mu F, and\ C_2 = 25nF$
   c. (10 points) What type of filter is it?
   d. (10 points) What is its maximum gain?



2. (40 points) Design a system composed of low-pass filters (LP), high-pass filters (HP), amplifiers, and adders that implements the following filter. Your answer should be in the form of a block diagram, similar to Figure 6-18 of your textbook.