

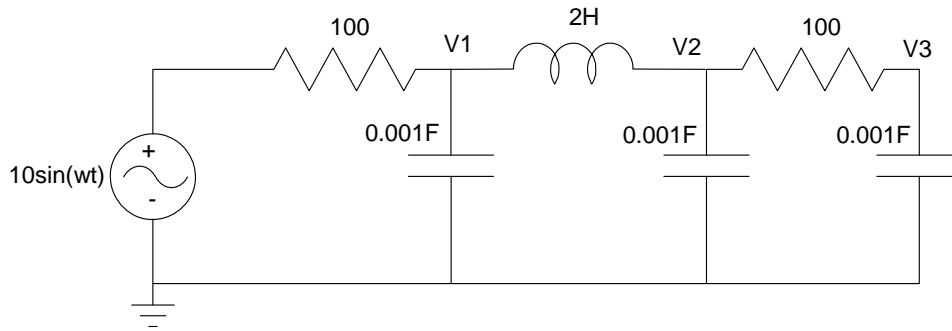
ECE 321 - Homework #2

Phasors - Poles, Zeros, & Frequency Response. Due Monday, November 16th

Problem 1) For the following circuit,

- Determine the impedances of each component at 10 rad/sec
- Write the voltage node equations, and
- Determine the node voltages

Problem 2) Repeat at 100 rad/sec

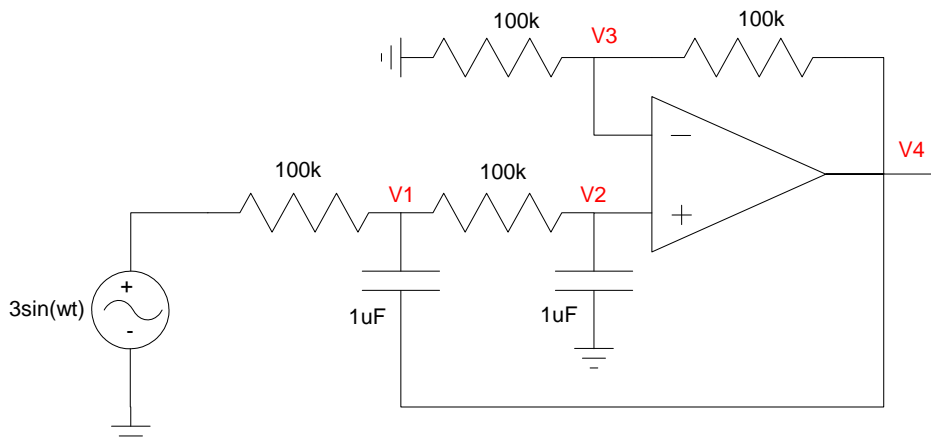


Problem 1 & 2

Problem 3) For the following op-amp circuit

- Determine the impedances of each component at 10 rad/sec
- Write the voltage node equations, and
- Determine the node voltages

Problem 4) Repeat at 100 rad/sec



Problem 3 & 4

Problem 5 - 7)

- Plot the gain vs. frequency for the following filter for $0 < \omega < 20$ rad/sec
- What kind of filter is it: low pass - band pass - high pass

$$5) Y = \left(\frac{4s}{s^2 + 4s + 50} \right) X$$

$$6) Y = \left(\frac{20,000}{(s^2 + 18s + 100)(s^2 + 8s + 100)} \right) X$$

$$7) Y = \left(\frac{s^4}{(s^2 + 18s + 100)(s^2 + 8s + 100)} \right) X$$

8) Give the transfer function for a filter which passes frequencies between 0 and 100 rad/sec (16Hz). Plot the gain of your filter from 0 to 300 rad/sec to check your design.

9) Give the transfer function for a filter which passes frequencies between 25 and 33 rad/sec. Plot the gain of your filter from 15 to 40 rad/sec to check your design.