

Physics 517/617 Homework 6 (Nov 17th)

Example OP Amp Circuits can be found at:

<http://hyperphysics.phy-astr.gsu.edu/hbase/electronic/opampvar.html>

<http://www.national.com/an/AN/AN-31.pdf>

Problems for OP Amps:

Basic Electronics, Curtis Meyers:

Chapter 6: Problem 5 (a-e), Problem 11

Plus the following problems:

- 1) Design an inverting OP Amp high pass filter (see Meyers) with a -3dB break point at a frequency of 600 Hz and a gain of -10 at high frequencies.
- 2) Design an OP Amp summing amplifier to sum four inputs v_a , v_b , v_c , and v_d resulting in an output $v_o = -(v_a + 2v_b + 4v_c + 8v_d)$. If one uses digital inputs (0 or 5V) this is a 4-bit digital to analog converter (DAC).
- 3) To make a voltmeter it is necessary to convert current into a voltage. Design an OP Amp current-to-voltage converter so that an input current of 100 nA into virtual ground gives a -2 volt output voltage.
- 4) A Op Amp can be used as a comparator with the output saturated at +15V or -15V based on the two inputs. For the input sine wave below sketch the output V_o as a function of time.

