H.W. # 7 - Spring 2015 EE 320 Engineering Electronics I

Show your work for credit.

1. Design a circuit that converts a 0 to 5 V pulse with a frequency of 1 kHz into a triangular waveform with a frequency of 1 kHz with and a peak-to-peak amplitude of 2 V. Use an op-amp integrator with the non-inverting input tied to a 2.5 V DC source. Verify the operation of your design using LTspice. Again, show your hand calculations for credit.

2. Develop an LTspice model for an op-amp that has a DC gain of 100 dB and a unity-gain frequency of 2.5 MHz. Show your hand calculations and sketch the open-loop response of the op-amp (verify with LTspice).

3. Estimate the bandwidth of a gain of +15 V/V amplifier using the op-amp from problem 2. Use LTspice to verify your answer.

4. Estimate the output voltage of an op-amp with an offset of 10 mV and a DC gain of 1,000 used in a inverting topology with a gain of -10. Assume the input is 0 V. Verify your answer with LTspice.