H.W. #21 EE 220 Spring 2017

Show your work for credit!

1. Design a circuit that creates a triangle waveform that swings between – 2 and + 2 V at 1 kHz. Assume the input to the circuit is a square-wave that oscillates at 1 kHz between – 2 and + 2 V. Show your hand calculations for credit. Verify your design using LTspice. (4 points)
2. Calculate the RMS value of a square wave that oscillates between – Vp and + Vp. Assume the square wave has a 50% duty cycle, that is, it is at + Vp the same amount of time it is at – Vp. (3 points)
3. Write equations for Vr, and sketch along with Vin, in the following circuits. Verify your answers with LTspice. (2 points)

PULSE(0 5 1m 1u 1u 10m 20m) (a)   PULSE(0 5 1m 1u 1u 10m 20m) (b)
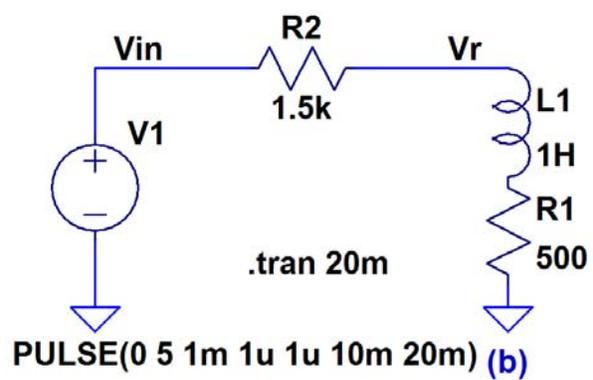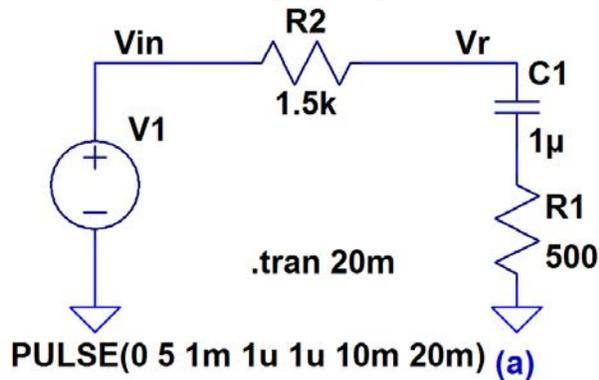
4. Determine Vout for each of the following circuits. Sketch Vout and Vin on the same plot. Show your hand calculations for credit. Verify your answers using LTspice. (8 points)

SINE(0 1 1k)   (a)   SINE(0 1 1k)   (b)

SINE(0 1 1k)   (c)   SINE(0 1 1k)   (d)