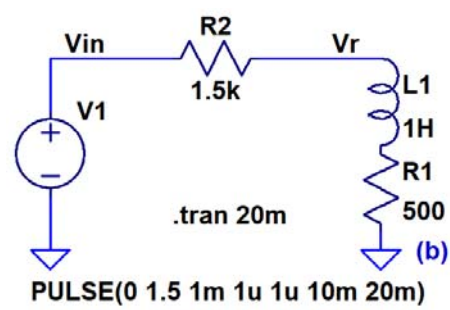
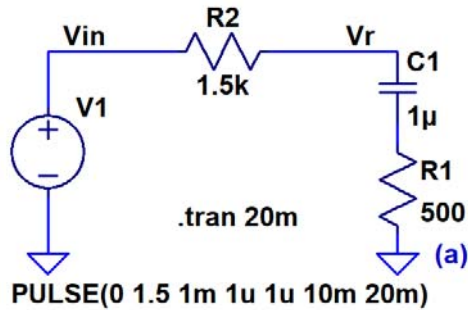


Show your work for credit!

1. Design a circuit that creates a triangle waveform that swings between -5 and $+5$ V at 1 kHz. Assume the input to the circuit is a square-wave that oscillates at 1 kHz between -1 and $+1$ 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 $-V_p$ and $+V_p$. Assume the square wave has a 50% duty cycle, that is, it is at $+V_p$ the same amount of time it is at $-V_p$. (3 points)
3. Write equations for V_r , and sketch along with V_{in} , in the following circuits. Verify your answers with LTspice. (2 points)



4. Determine V_{out} for each of the following circuits. Sketch V_{out} and V_{in} on the same plot. Show your hand calculations for credit. Verify your answers using LTspice. (8 points)

