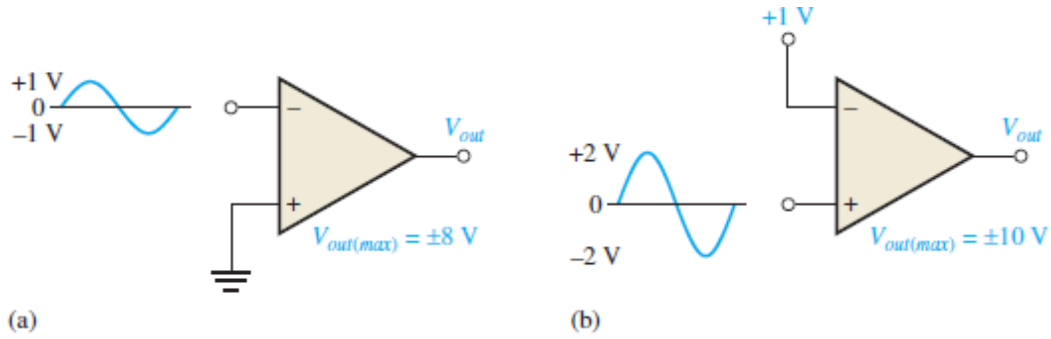
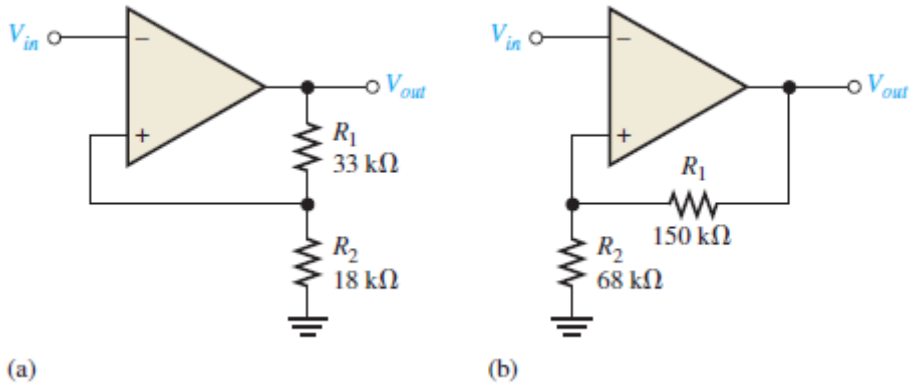
Electronic Circuits
Op- Amp
Sheet 3

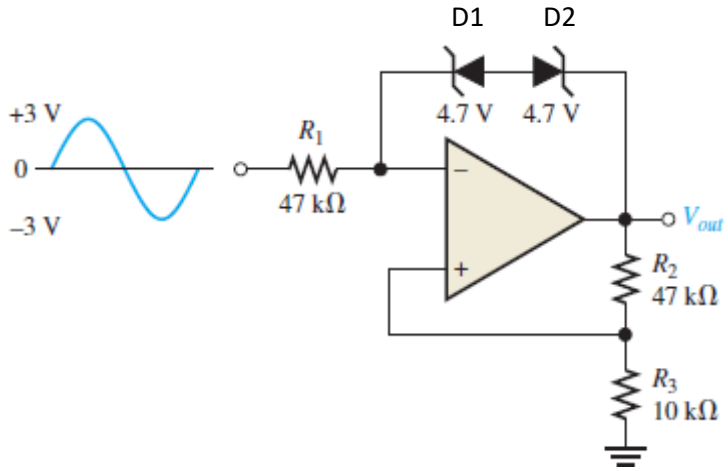
1. Draw the output voltage waveform for each circuit shown with respect tothe input. Show voltage levels.



2. Determine the hysteresis voltage for each comparator shown. The maximum output levels are ±11 V.

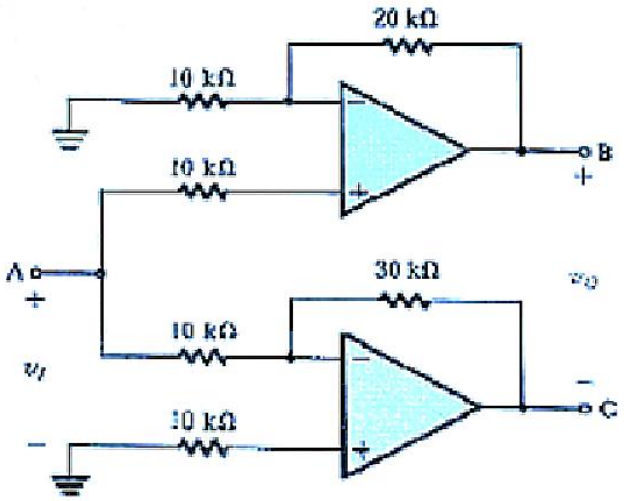


3. Determine the output voltage waveform in the following figure.



4. Design a noninverting amplifier with the gain of 2. At the maximum output voltage of 10V the current in the voltage divider is to be 10 μA.

5. Calculate V_B, V_C and the voltage gain (V_{out}/v_{in}) for the circuit shown



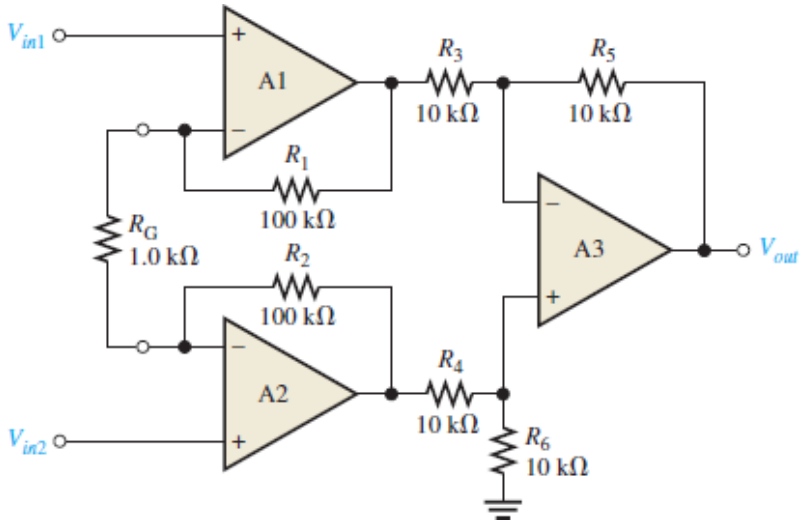
6. For the instrumentation amplifier configuration shown in figure.

a) Find the voltage gains of op-amps A_1 and A_2.

b) Find the overall voltage gain of the instrumentation amplifier

c) The following voltages are applied to the instrumentation amplifier: V_{in1} = 5mV, V_{in2} = 10mV, V_{cm} = 225mV. Determine the final output voltage.

d) What value of R_G must be used to change the gain of the instrumentationamplifier to 1000?



7. For instrumentation amplifier shown, derive an expression for i_o