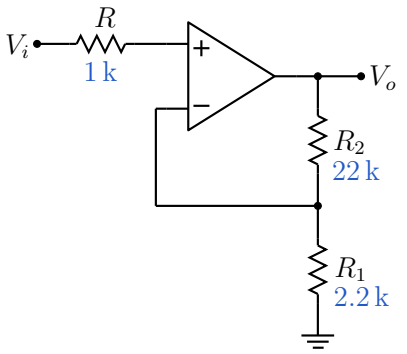
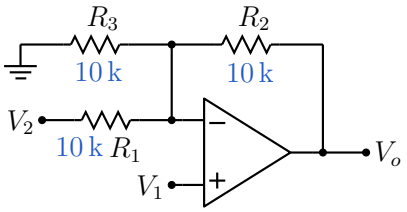
EE 112 (MBP): HW 8 (March 27, 2017)

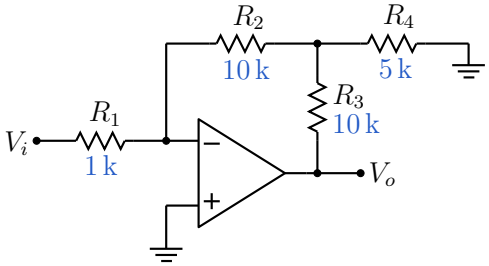
1. What is V_o if $V_i = 0.1\,\text{V}$?



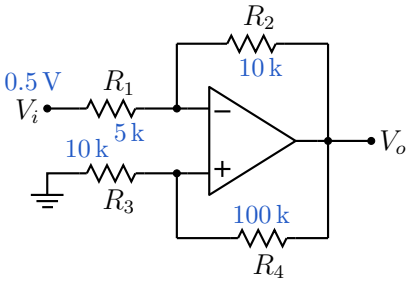
2. What is V_o in terms of V_1 and V_2?



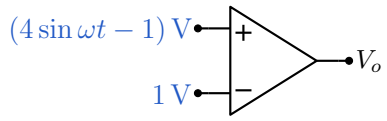
3. Find V_o/V_i.



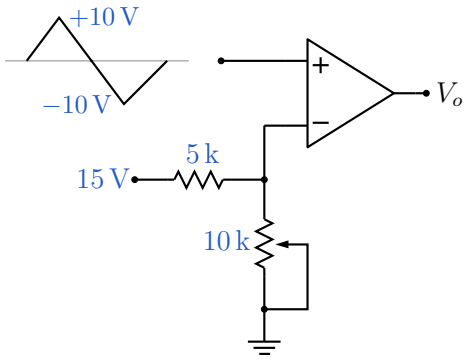
4. What is V_o?



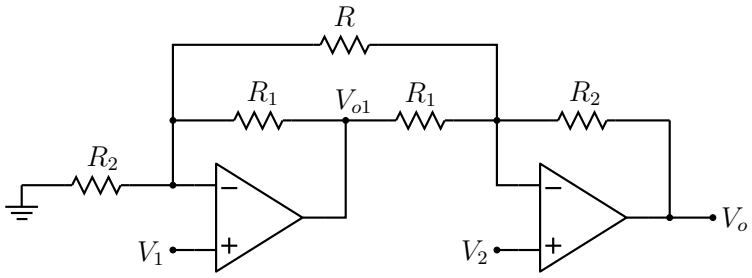
5. In the circuit shown in the figure, the op-amp operates in the open-loop configuration. Define D (duty ratio) as the fraction of the time the output V_o is high. What is D?



6. In the circuit shown in the figure, what is the duty cycle of the output waveform if the wiper is in the (a) top position, (b) middle position, (c) bottom position.



7. In the circuit shown in the figure, assume that the op-amps are operating in the linear region. Let $R_1 = R = 1\,\text{k}\Omega$, $R_2 = 2\,\text{k}\Omega$, $V_1 = 0.5\,\text{V}$, $V_2 = 0.55\,\text{V}$. Find V_{o1} and V_o. Derive a general expression for V_o in terms of V_1 and V_2.



8. Assuming that the op-amp is operating in the linear region, what is i_L in the circuit shown in the figure? What is the functionality of this circuit?