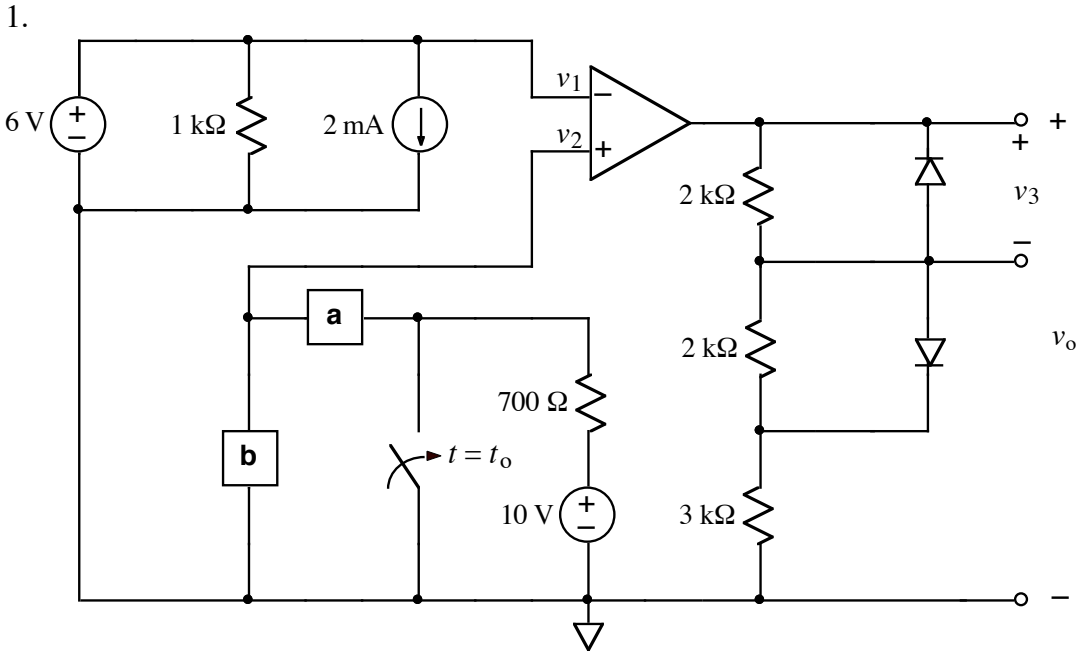
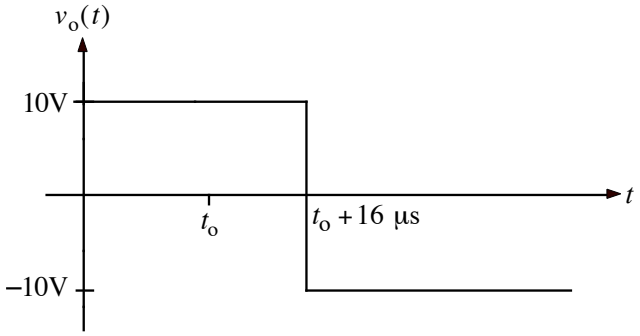
HOMEWORK #18

1.



After being open for a long time, the switch closes at time $t = t_o$.

Rail voltages = ±10 V



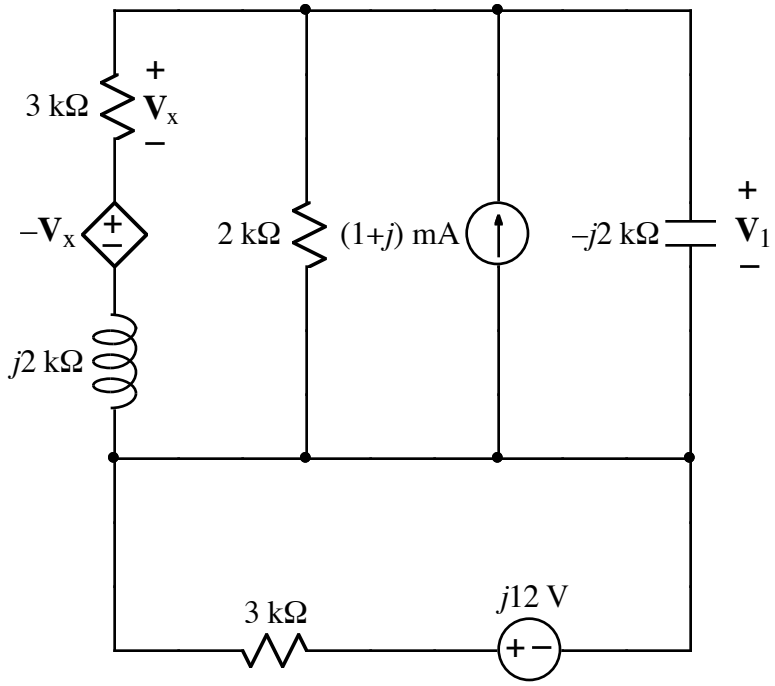
Choose either an R or L to go in box **a** and either an R or L to go in box **b** to produce the $v_o(t)$ shown above. (You will need one R and one L. Use an R value of 1.3 kΩ. Also, note that v_o stays low forever after $t_o + 16$ µs.) Specify which element goes in each box and its value.

2. Sketch $v_1(t)$, showing numerical values appropriately.

3. a) Sketch $v_2(t)$, showing numerical values appropriately.

   b) Sketch $v_3(t)$. Show numerical values for $t < t_o$, for $t_o < t < t_o + 16$ µs, and for $t > t_o + 16$ µs. Use the ideal model of the diode: when forward biased, its resistance is zero; when reverse biased, its resistance is infinite.

4.



A frequency-domain circuit is shown above. Write the value of phasor voltage $\mathbf{V}_1$ in rectangular form.

5. Given ω = 500 rad/s, write a numerical time-domain expression for $v_1(t)$, the inverse phasor of $\mathbf{V}_1$.