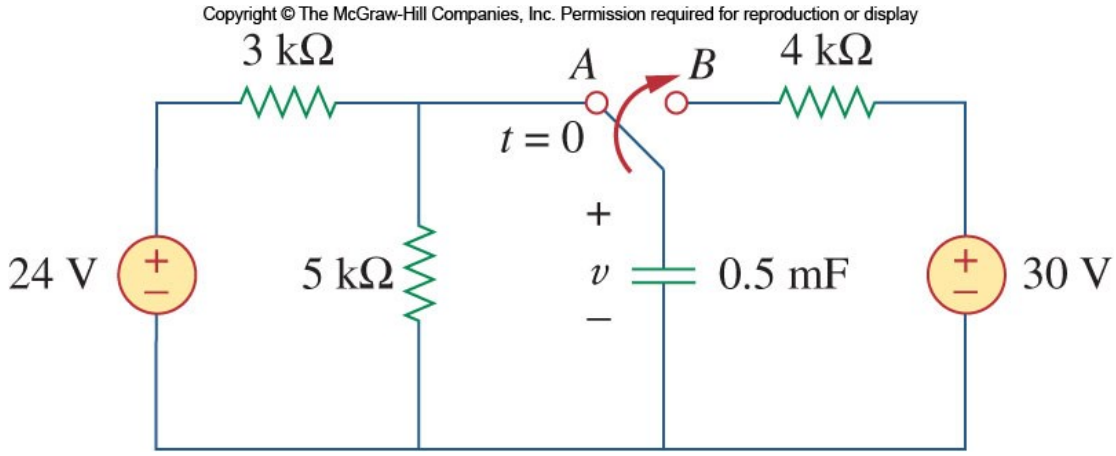
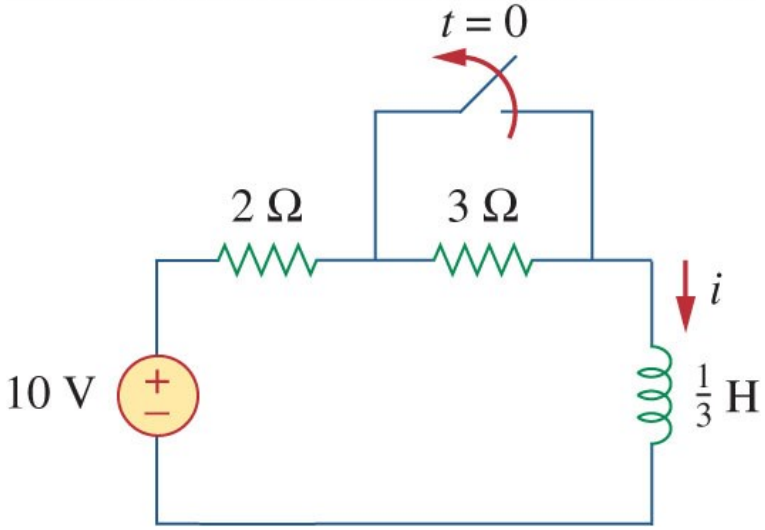
Example

- The switch has been in position A for a long time. At $t = 0$, the switch moves to B. Find $v(t)$.



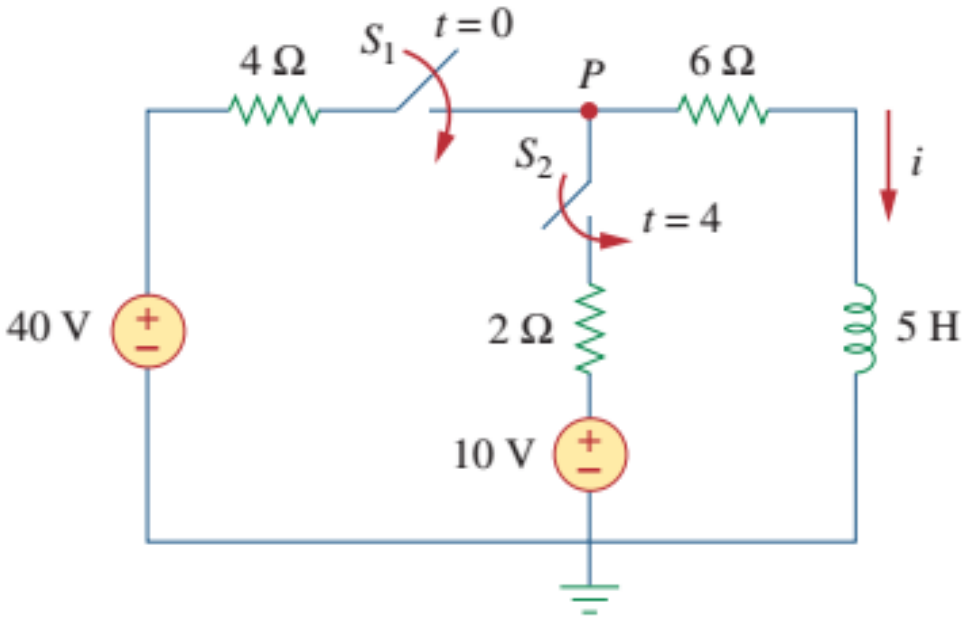
Example

- Find $i(t)$ in the circuit for $t > 0$. Assume that the switch has been closed for a long time.



Sequential switch

At $t = 0$, switch 1 in Fig. 7.53 is closed, and switch 2 is closed 4 s later. Find $i(t)$ for $t > 0$. Calculate i for $t = 2$ s and $t = 5$ s.

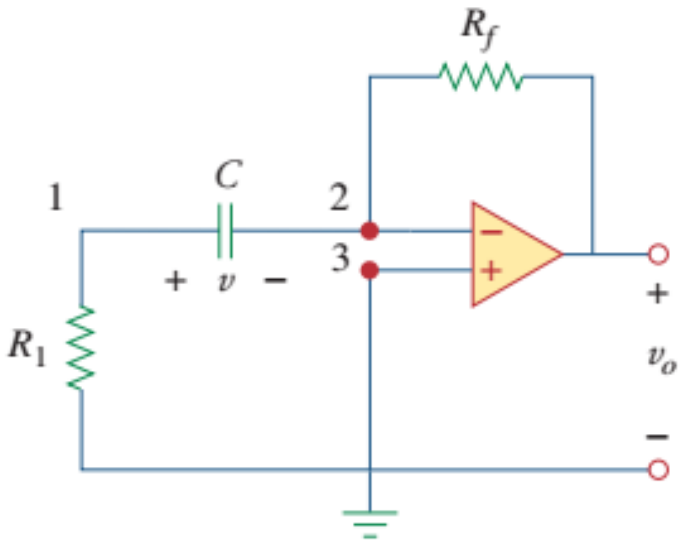


We need to consider the three time intervals $t \leq 0$, $0 \leq t \leq 4$, and $t \geq 4$ separately. For $t < 0$, switches S_1 and S_2 are open so that $i = 0$. Since the inductor current cannot change instantly,

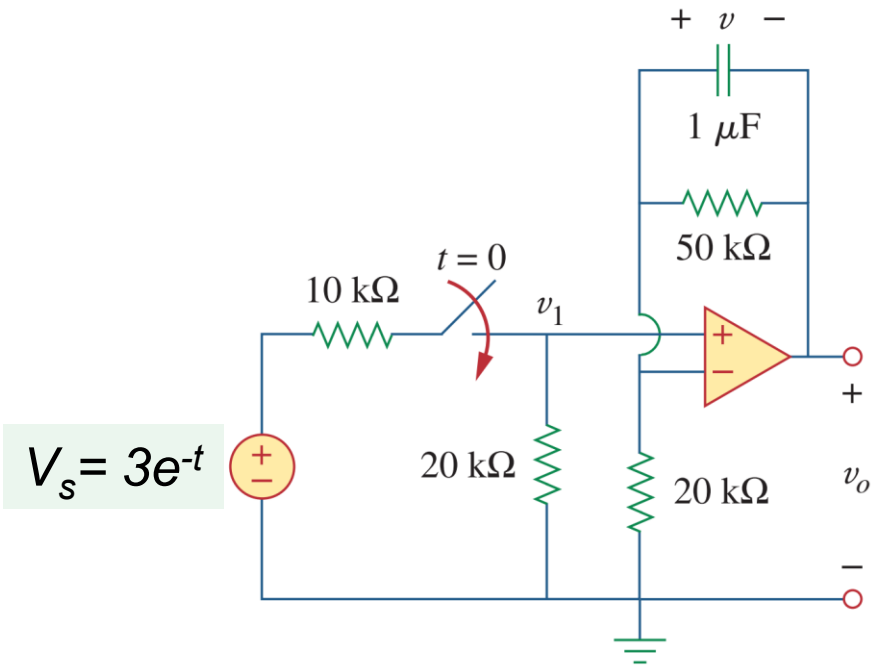
$$i(0^-) = i(0) = i(0^+) = 0$$

First order op-amp circuit

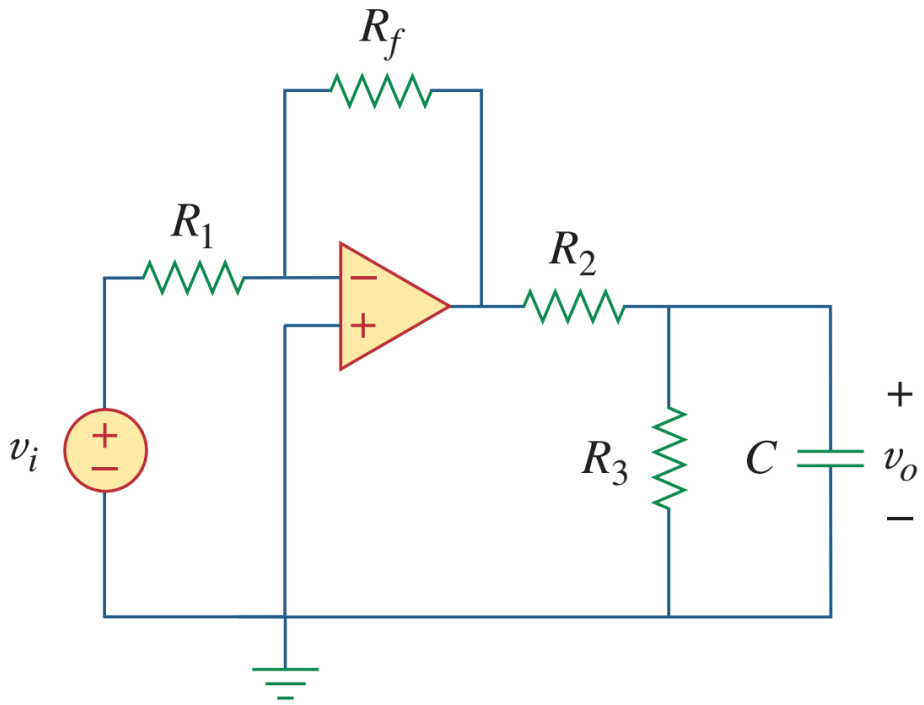
For the op amp circuit in Fig. 7.55(a), find v_o for $t > 0$, given that $v(0) = 3$ V. Let $R_f = 80\ \text{k}\Omega$, $R_1 = 20\ \text{k}\Omega$, and $C = 5\ \mu\text{F}$.



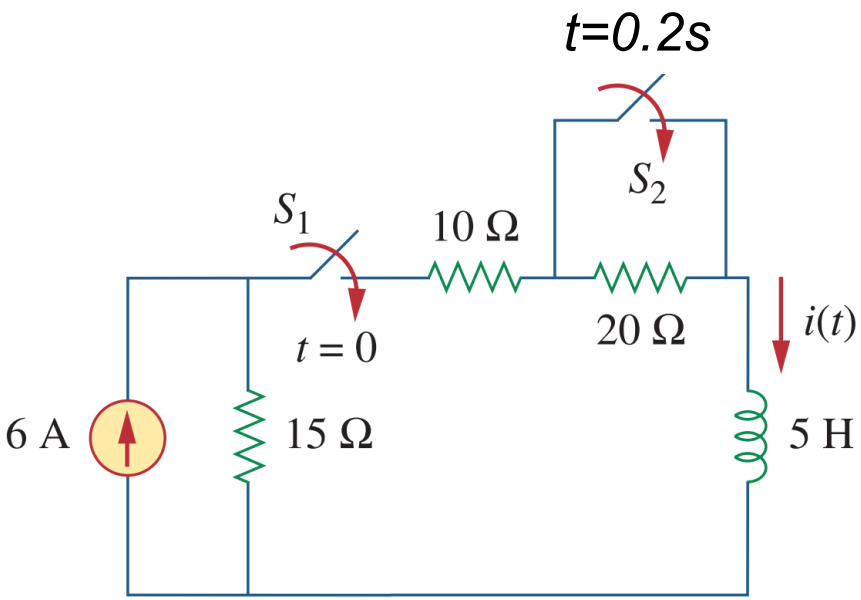
(a)


+ v −
1 μF
50 kΩ
t = 0
10 kΩ
v1
20 kΩ
20 kΩ
+
vo
−
Vs = 3e-t

Find the step response $v_o(t)$ for $t > 0$ in the op amp circuit of Fig. 7.59. Let $v_i = 2u(t)$ V, $R_1 = 20\ \text{k}\Omega$, $R_f = 50\ \text{k}\Omega$, $R_2 = R_3 = 10\ \text{k}\Omega$, $C = 2\ \mu\text{F}$.



Practice



Practice