7.1 In the circuit shown in Fig. 7.81

$$v(t) = 56e^{-200t}\ \text{V}, \quad t > 0$$
$$i(t) = 8e^{-200t}\ \text{mA}, \quad t > 0$$

(a) Find the values of R and C.

(b) Calculate the time constant τ.

(c) Determine the time required for the voltage to decay half its initial value at $t = 0$.

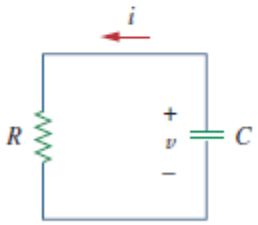

Figure 7.81
For Prob. 7.1.

7.6 The switch in Fig. 7.86 has been closed for a long time, and it opens at $t = 0$. Find $v(t)$ for $t \geq 0$.

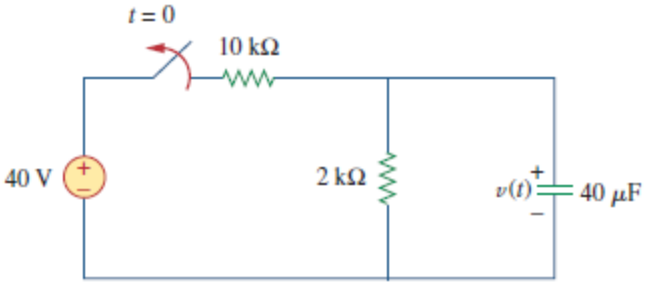

Figure 7.86
For Prob. 7.6.

7.11 For the circuit in Fig. 7.91, find i_o for $t > 0$.

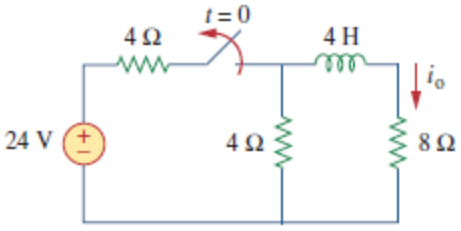

Figure 7.91
For Prob. 7.11.

7.26 Express the signals in Fig. 7.104 in terms of singularity functions.

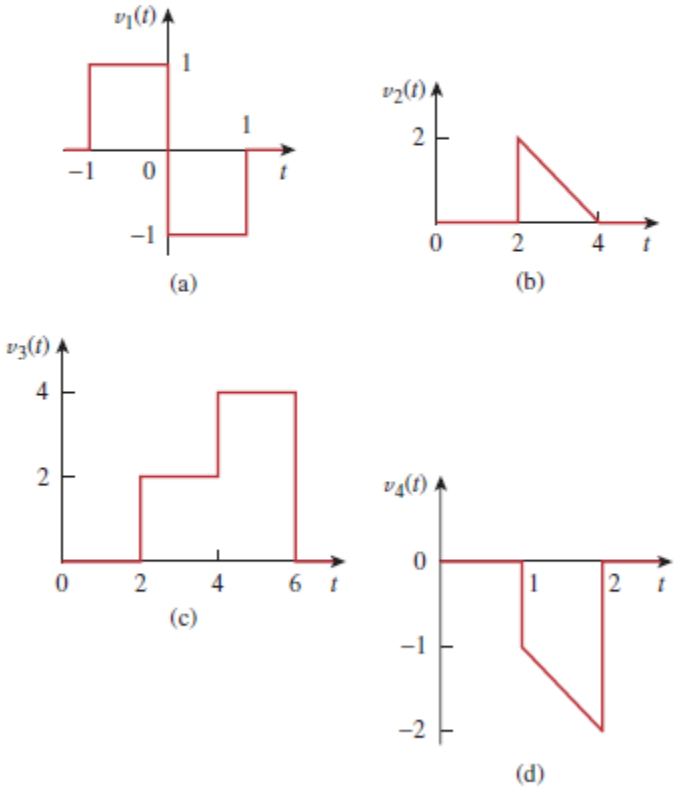

Figure 7.104
For Prob. 7.26.

7.43 Consider the circuit in Fig. 7.110. Find $i(t)$ for $t < 0$ and $t > 0$.

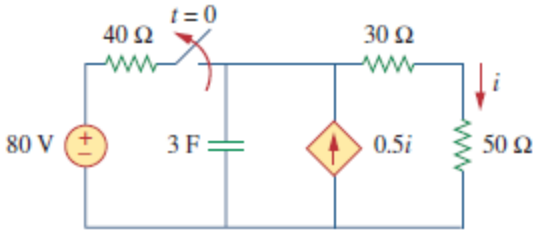

Figure 7.110
For Prob. 7.43.

7.45 Find v_o in the circuit of Fig. 7.112 when $v_s = 30u(t)$ V. Assume that $v_o(0) = 5$ V.

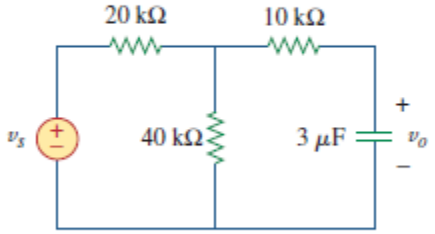

Figure 7.112
For Prob. 7.45.

7.56 For the network shown in Fig. 7.122, find $v(t)$ for $t > 0$.

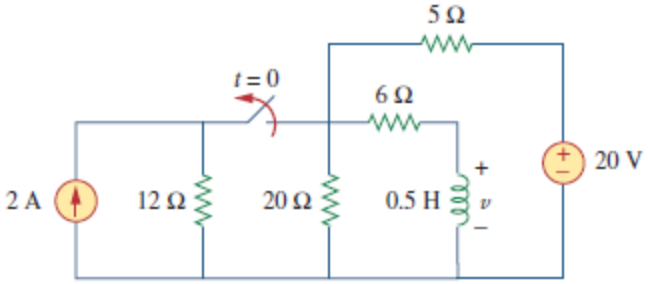

Figure 7.122
For Prob. 7.56.

7.65 If the input pulse in Fig. 7.130(a) is applied to the circuit in Fig. 7.130(b), determine the response $i(t)$.

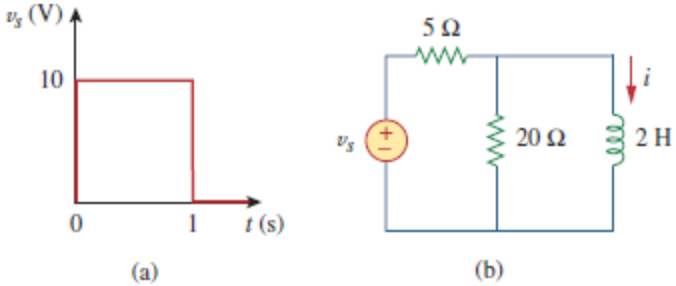

Figure 7.130
For Prob. 7.65.

7.73 For the op amp circuit of Fig. 7.138, let $R_1 = 10\ \text{k}\Omega$, $R_f = 20\ \text{k}\Omega$, $C = 20\ \mu\text{F}$, and $v(0) = 1V$. Find v_o.

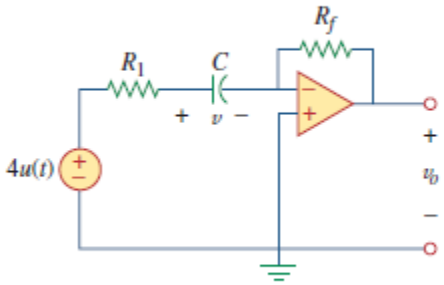

Figure 7.138
For Prob. 7.73.