

14.31 Find $i_o(t)$, $t > 0$, in the network in Fig. P14.31.

PSV

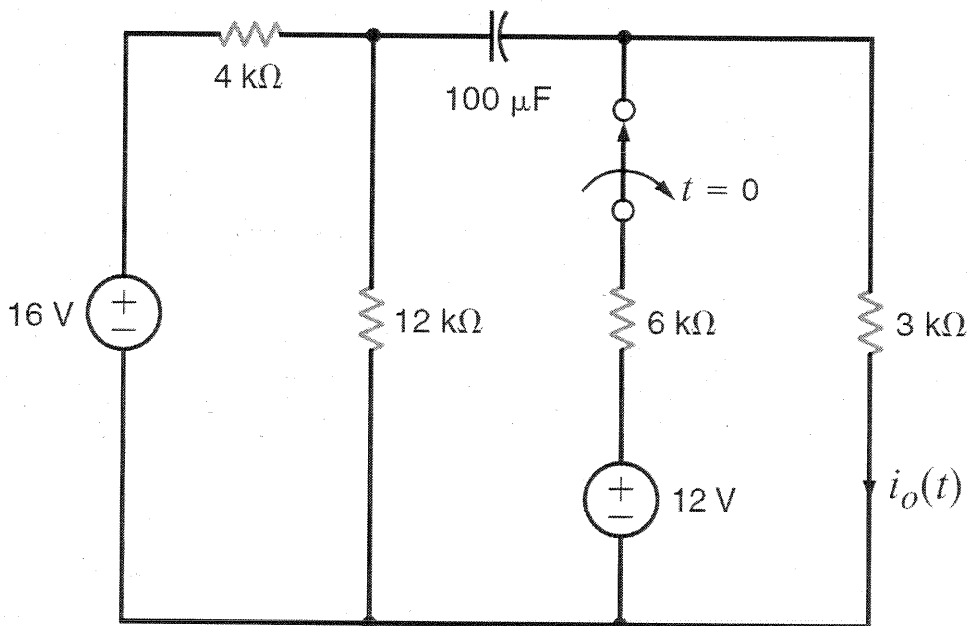
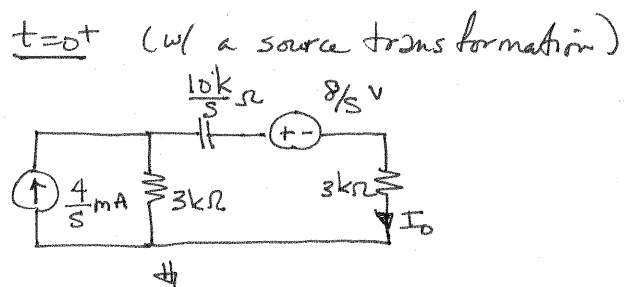
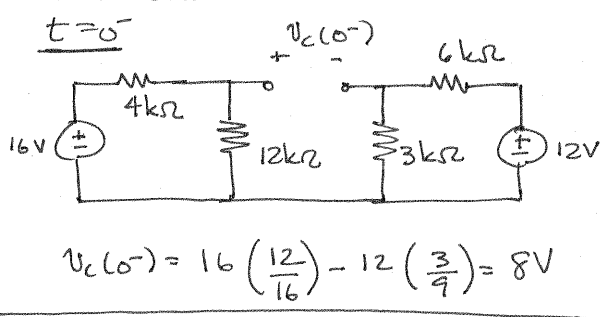


Figure P14.31

SOLUTION:



$$\frac{12}{s} = \left(3000 + 3000 + \frac{10^4}{s} \right) I_o + \frac{8}{s} \quad \Leftrightarrow \quad \frac{12}{s} V \quad \begin{array}{c} 3k\Omega \\ \uparrow \\ \text{12V} \\ \downarrow \\ \frac{10k}{s} \end{array}$$

$$I_o = \frac{4}{6s + 10} \text{ mA} = \frac{2/3}{s + 5/3}$$

$$i_o(t) = \frac{2}{3} e^{-(5/3)t} u(t) \text{ mA}$$