

Chapter 7, Solution 40.

(a) Before $t = 0$, $v = 12 \text{ V}$.

After $t = 0$, $v(t) = v(\infty) + [v(0) - v(\infty)]e^{-t/\tau}$

$$v(\infty) = 4, \quad v(0) = 12, \quad \tau = RC = (2)(3) = 6$$

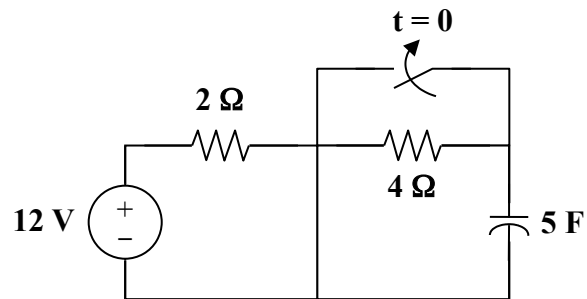
$$v(t) = 4 + (12 - 4)e^{-t/6}$$

$$v(t) = 4 + 8e^{-t/6} \text{ V}$$

(b) Before $t = 0$, $v = 12 \text{ V}$.

After $t = 0$, $v(t) = v(\infty) + [v(0) - v(\infty)]e^{-t/\tau}$

After transforming the current source, the circuit is shown below.



$$v(0) = 12, \quad v(\infty) = 12, \quad \tau = RC = (2)(5) = 10$$

$$v = 12 \text{ V}$$