

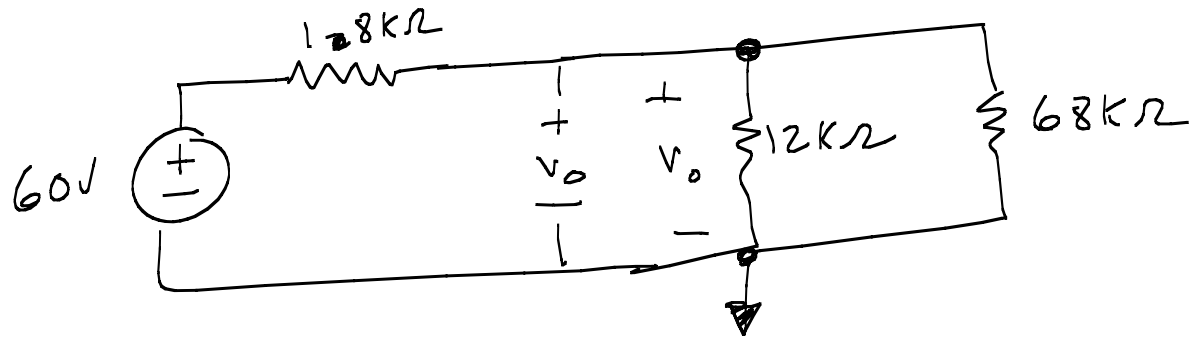
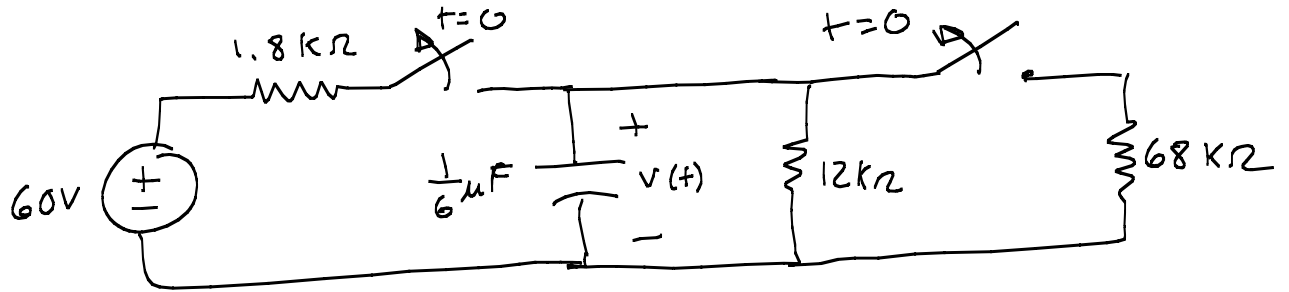
Problem 3

Determine

- $v(t)$

- Energy that has been dissipated to the resistor after 2ms

$$v(t) = V_0 e^{-t/\tau c}$$



$$\frac{V_0 - 60V}{1.8k\Omega} + \frac{V_0}{12k\Omega} + \frac{V_0}{68k\Omega} = 0$$

$V_0 = 51V$

$$v(t) = 51 e^{-t/(12,000\Omega)(\frac{1}{6} \times 10^{-6}F)}$$

$$v(t) = 51 e^{-500t}$$

$$w(t) = \frac{1}{2} C v_0^2 (1 - e^{-2t/RC})$$

$$= \frac{1}{2} (\frac{1}{6} \times 10^{-6}F) (51V)^2 (1 - e^{-1000t})$$

$$w(t) = (2.17 \times 10^{-4}) (1 - e^{-1000t})$$

$$w(2 \times 10^{-3}s) = 1.874 \times 10^{-4} \text{ J} = \boxed{187.4 \mu\text{J}}$$