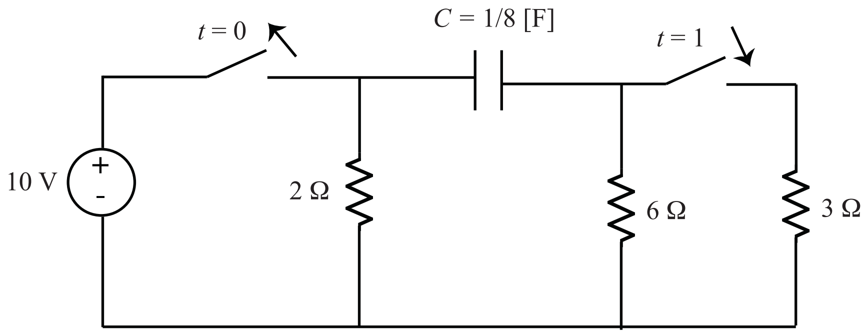
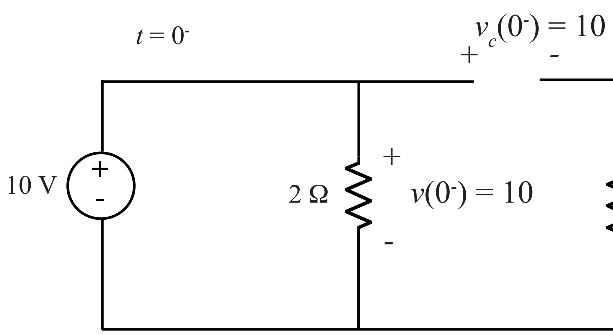
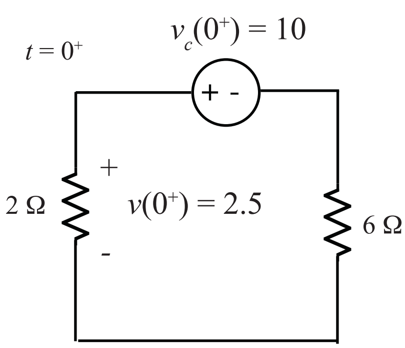
For the circuit, we want to find $v(t)$ for all $0^- < t < \infty$



At $t = 0^-$ we have:



So, at $t = 0^+$ we have



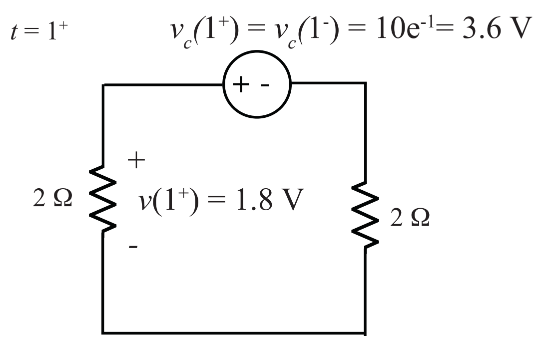
So, for $0^+ < t < 1^-$ we have: $v(t) = v(\infty) + \left[v(0^+) - v(\infty) \right] e^{-t/\tau_1} = 2.5 e^{-t}$

and

$$v_c(t) = v_c(\infty) + \left[v_c(0^+) - v_c(\infty) \right] e^{-t/\tau_1} = 10 e^{-t} \quad \tau_2 = (4)*(1/8) = 0.5$$

$v(1^-) = 0.92$ [V] and. $v_c(1^-) = 3.68$ [V]

At $t = 1^+$ the circuit looks like:



So, $v(t) = v(\infty) + \left[v(1^+) - v(\infty)\right]e^{-(t-1)/\tau_2} = 1.8e^{-(t-1)/0.5}$ for $t > 1$, where $\tau_2 = (4)*(1/8) = 0.5$

(Notice here that a shifted exponential function is being used here since the switching time isn't 0)

So, v(t) is: