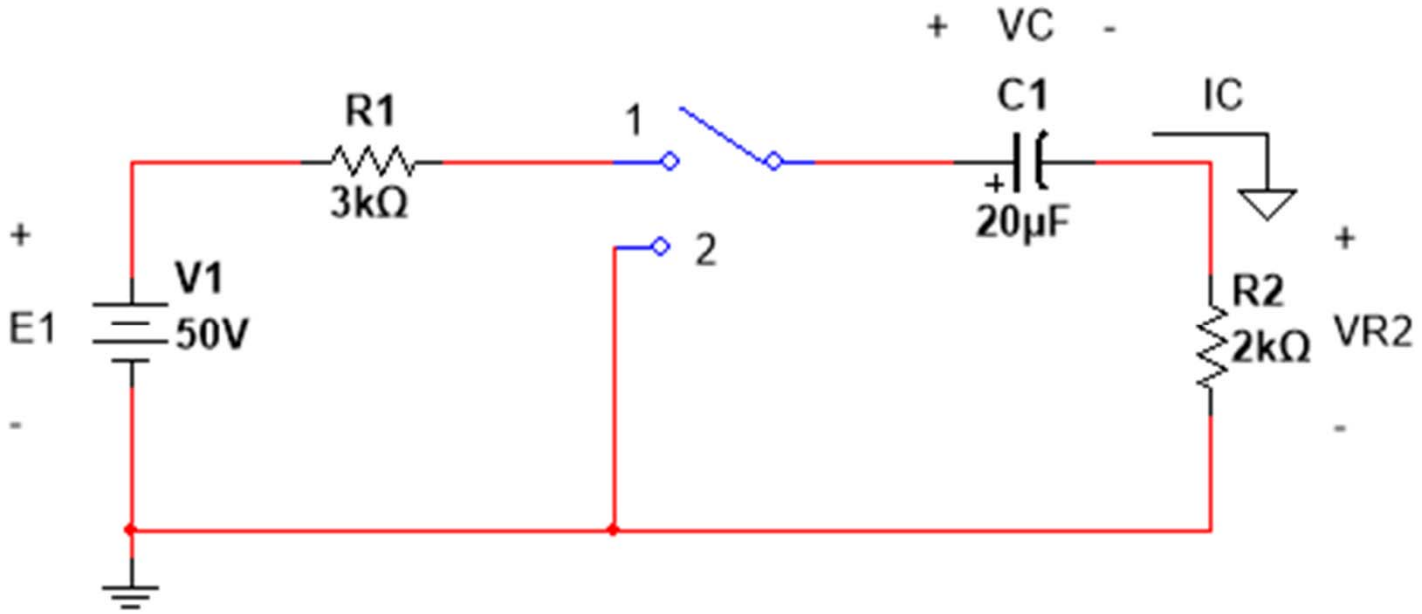
In Class Problem

Find t for $V_C(t)$ = 25 V for charge and discharge

- No initial charge on C1
- Switch to pos 1 at t = 0
- Switch to pos 2 at t = 1 sec



Same circuit as earlier

Find t for $V_C(t) = 25$ V

Charge Phase: $v_c(t) = 50(1 - e^{\frac{-t}{0.1}})V$

$$25V = 50(1 - e^{\frac{-t}{0.1}})V$$

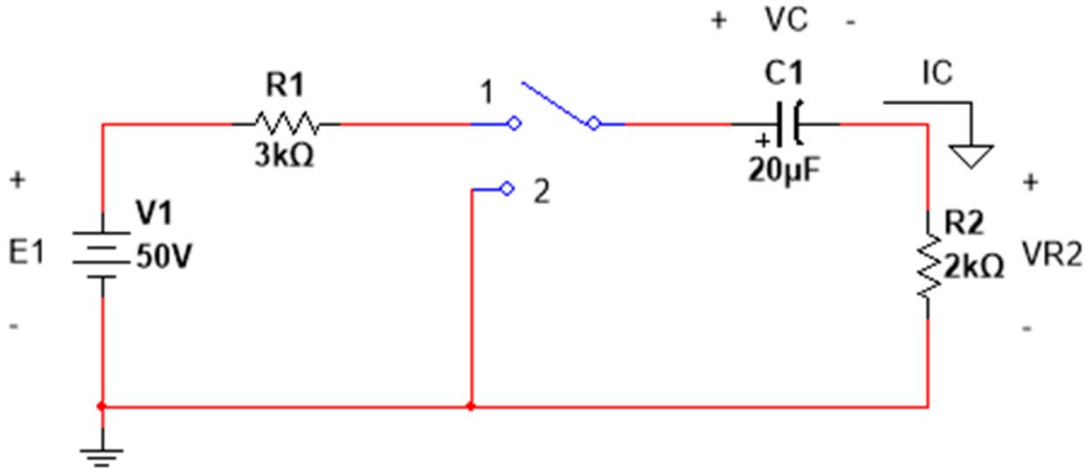
$$0.5 = 1 - e^{\frac{-t}{0.1}}$$

$$-0.5 = -e^{\frac{-t}{0.1}}$$

$$0.5 = e^{\frac{-t}{0.1}}$$

$$ln(0.5) = ln(e^{\frac{-t}{0.1}})$$

$$-0.693 = \frac{-t}{0.1}$$



t = 69.32 msec

Checking, v_C (69.32 msec) = 25 V

NP

Find t for $V_C(t) = 25$ V

Discharge Phase:

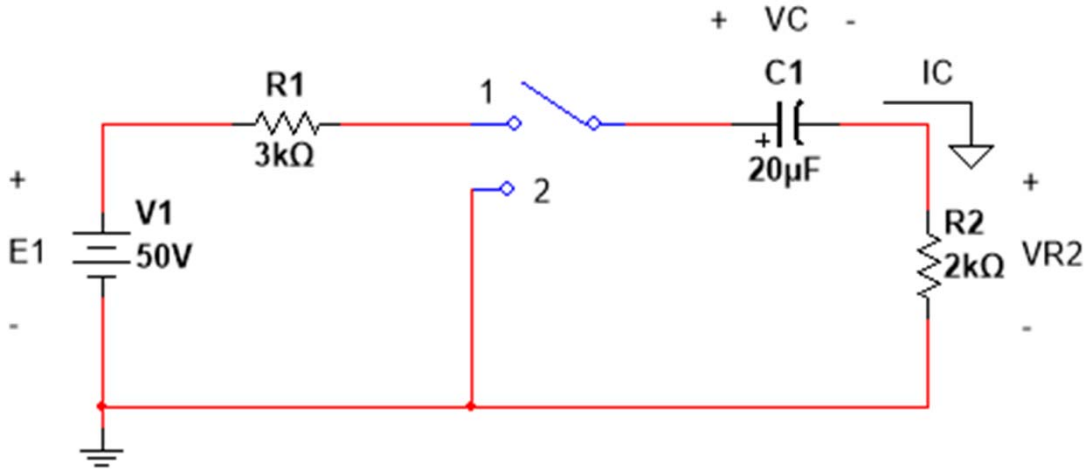
$$v_c(t) = 50e^{\frac{-(t-1)}{0.04}}$$

$$25 = 50e^{\frac{-(t-1)}{0.04}}$$

$$ln(0.5) = ln(e^{\frac{-(t-1)}{0.04}})$$

$$-0.693 = \frac{-(t-1)}{0.04}$$

$$27.726 \cdot 10^{-3} = t - 1$$



t = 1.0277 sec

Checking, v_C (1.0277 sec) = 25.02 V

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