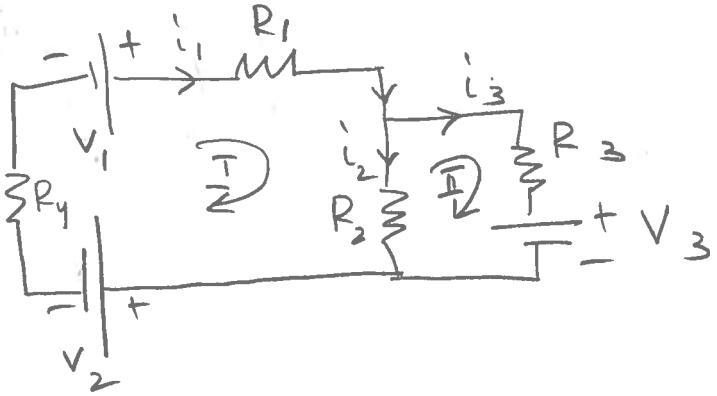
Answers Exam 2 2018

1. $i_1 = i_2 + i_3$

$-V_1 + i_1 R_1 + i_2 R_2 + V_2 + i_1 R_4 = 0$

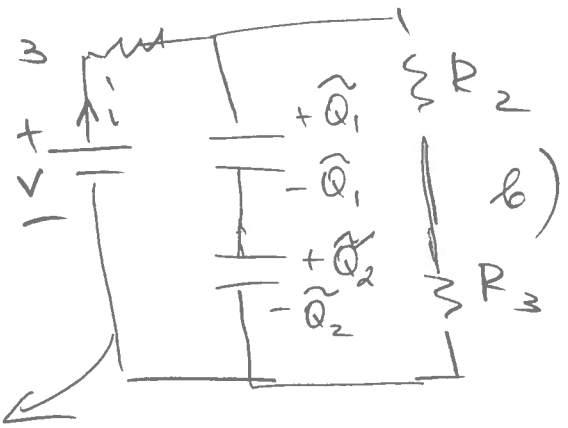
$i_3 R_3 + V_3 - i_2 R_2 = 0$



2. a) $i = \dfrac{V}{R_1 + R_2 + R_3}$

$Q_1 = C_1 R_2 i$

$Q_2 = C_2 R_3 i$



b)
$$\begin{cases} -V + iR_1 + iR_2 + iR_3 = 0 \\ -V + iR_1 + \dfrac{\tilde{Q}_1}{C_1} + \dfrac{\tilde{Q}_2}{C_2} = 0 \\ -Q_1 + Q_2 = -\tilde{Q}_1 + \tilde{Q}_2 \end{cases}$$

3. $V(2R_2) - V(0) = -\dfrac{\rho R_1^2}{4\varepsilon_0} - \dfrac{\rho R_1^2}{2\varepsilon_0} \ln 2$

4. $V(b) - V(a) = \dfrac{\rho_1 i}{4\pi}\left(\dfrac{1}{R_B} - \dfrac{1}{R_A}\right) + \dfrac{\rho_2 i}{4\pi}\left(\dfrac{1}{R_C} - \dfrac{1}{R_B}\right)$