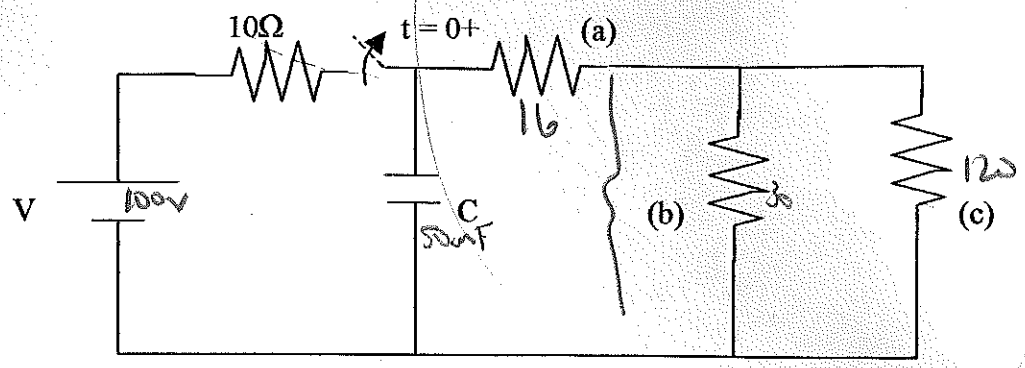
RC circuit



V = 100V
C = 50μF
Ra = 16 Ω
Rb = 30 Ω
Rc = 120 Ω

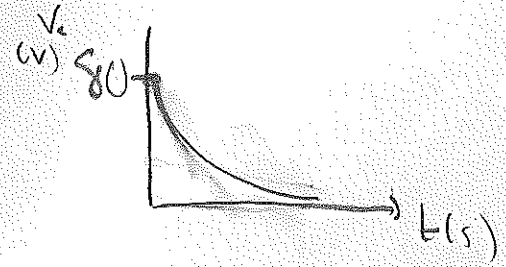
The switch in the above circuit has been closed for a long period of time, allowing the circuit to reach steady state conditions. At time, t= 0+, the switch is opened. Determine the following:

80V a. The voltage across the capacitor at t=0- (just before switch is open) 80V
0 b. The current down the capacitor branch at t=0- (just before the switch is open) 0
2Amps c. The total current supplied by the battery at t=0- (just before switch is open) 2 Amps

The switch is then open at t=0+

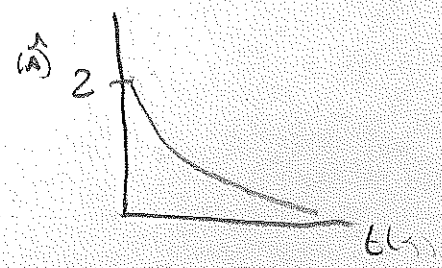
.002 d. The time constant of the discharging circuit.
80 e. The voltage across the capacitor as a function of time.
2 f. The current across resistor **a** as a function of time.
32 g. The voltage across resistor **a** as a function of time.
48 h. The voltage across resistor **b** as a function of time.
48 i. The voltage across resistor **c** as a function of time.
j. Make individual quantitative graphs of parts e through i, starting at t=0+.

e) $V_c(t)$

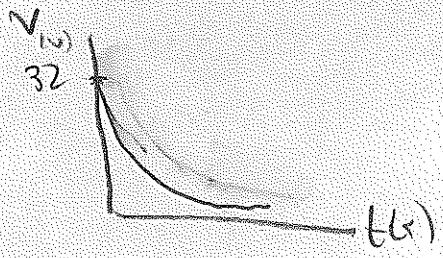


f) $\lambda_a(t)$

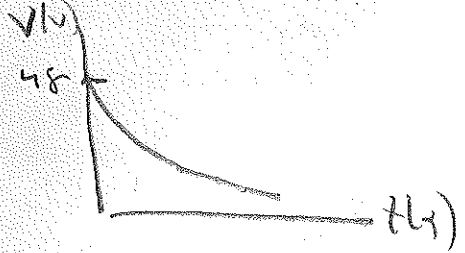
$2e^{-50t}$



g) $V_a(t)$



h) $V_b(t)$



i) $V_c(t)$