

93. (First problem of **Cluster**)

(a)  $R_2$  and  $R_3$  are in parallel; their equivalence is in series with  $R_1$ . Therefore,

$$R_{\text{eq}} = R_1 + \frac{R_2 R_3}{R_2 + R_3} = 300 \, \Omega \quad .$$

(b) The current through the battery is  $\mathcal{E}/R_{\text{eq}} = 0.0200 \, \text{A}$ , which is also the current through  $R_1$ . Hence, the voltage across  $R_1$  is  $V_1 = (0.0200 \, \text{A})(100 \, \Omega) = 2.00 \, \text{V}$ .

(c) From the loop rule,

$$\mathcal{E} - V_1 - i_3 R_3 = 0$$

which yields  $i_3 = 6.67 \times 10^{-3} \, \text{A}$ .