95. (Third problem of **Cluster**)

(a) Using the junction rule ($i_1 = i_2 + i_3$) we write two loop rule equations:

$$\begin{aligned} \mathcal{E}_1 - i_2 R_2 - (i_2 + i_3)\, R_1 &= 0 \\ \mathcal{E}_2 - i_3 R_3 - (i_2 + i_3)\, R_1 &= 0 \ . \end{aligned}$$

Solving, we find $i_2 = 0.0109$ A (rightward, as was assumed in writing the equations as we did), $i_3 = 0.0273$ A (leftward), and $i_1 = i_2 + i_3 = 0.0382$ A (downward).

(b) See the results in part (a).

(c) See the results in part (a).

(d) The voltage across R_1 equals V_A: $(0.0382\text{ A})(100\ \Omega) = +3.82$ V.