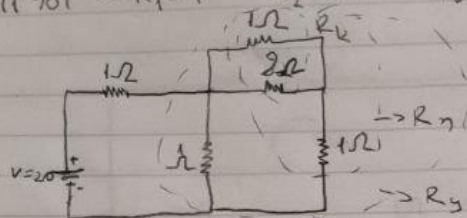


20011901 $\rightarrow R_1=1$ $R_2=1$ $R_3=9$ $R_4=1$ $R_5=1$



	I_1	I_2	I_3	I_4	I_5
Manual	12,09 A	+3,7512 A	+7,921 A	0,4168 A	+4,168 A
Simulasi	+12,1 A	+3,75 A	+7,92 A	+0,42 A	+4,17 A

$$V = I \cdot R$$

$$R_k = \frac{1 \times 9}{1+9} = \frac{9}{10} \Omega \quad R_{eq} = \frac{19}{29} + 1 = 1,653 \Omega \quad 20 = 1,653 \times I$$

$$R_n = \frac{9}{10} + 1 = \frac{19}{10} \Omega \quad I = 12,09 A$$

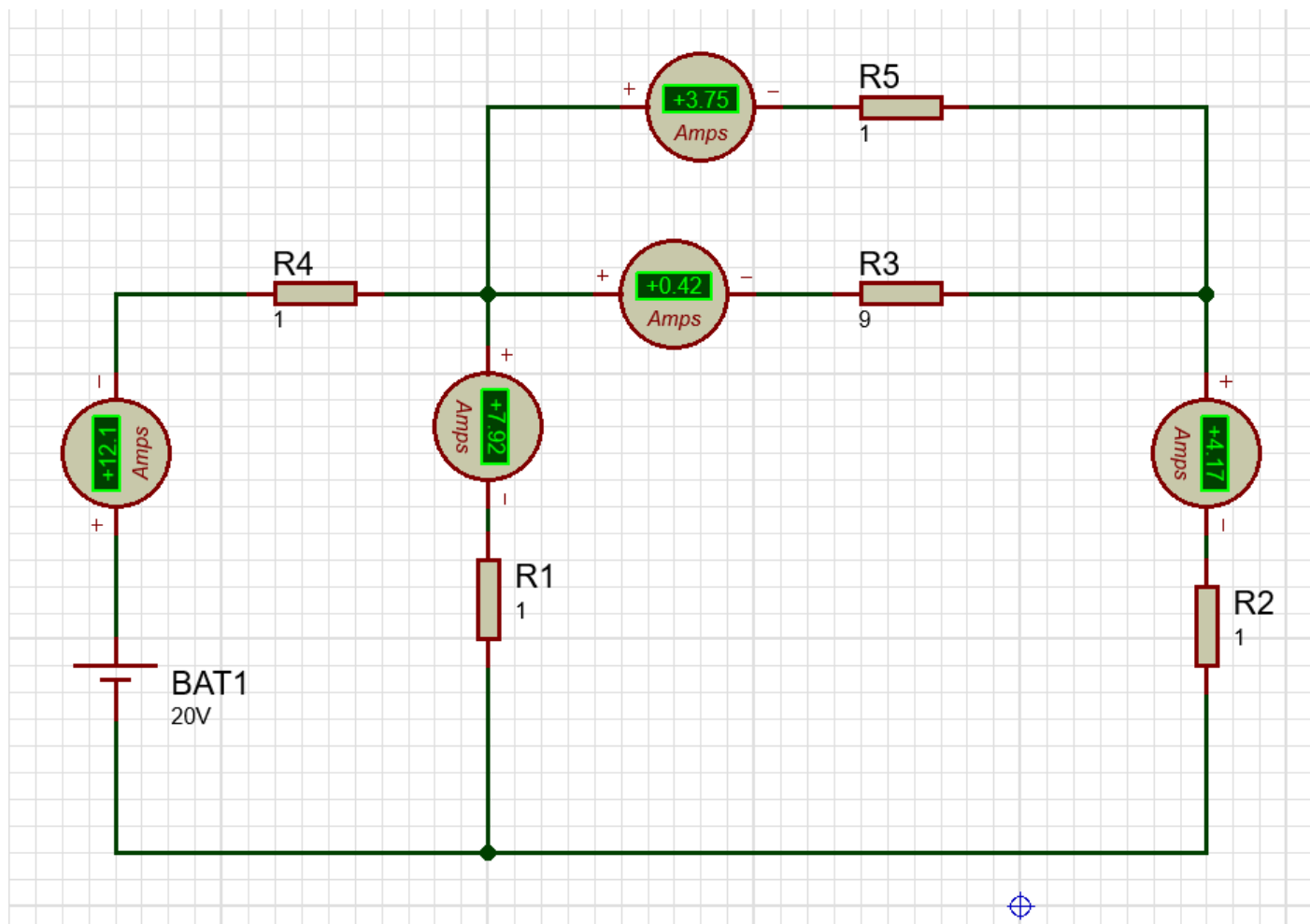
$$\frac{1}{R_y} = \frac{10}{19} + 1 = \frac{29}{19} \Omega \quad R_y = \frac{19}{29} \Omega \quad I_1 = \frac{1,653}{1,653} \cdot 12,09 A = 12,09 A$$

$$I_5 = I_2 + I_4 = \frac{1}{1 + \frac{19}{10}} \times 12,09 A = 4,168 A$$

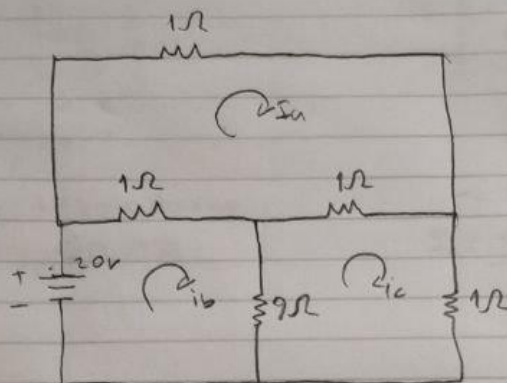
$$I_3 = \frac{19}{\frac{10}{1 + \frac{19}{10}}} \times 12,09 A = 7,921 A$$

$$I_2 = \frac{9}{10} \times 4,168 A = 3,7512 A$$

$$I_4 = \frac{1}{10} \times 4,168 A = 0,4168 A$$



20011901 $\rightarrow R_1 = 1\Omega$ $R_2 = 1\Omega$ $R_3 = 9\Omega$ $R_4 = 1\Omega$ $R_5 = 1\Omega$



	I_1	I_2	I_3	I_4	I_5
Manual	+8,33A	+5,06A	+3,34A	+1,66A	+11,67A
Simulation	+8,33A	+5,00A	+3,33A	+1,67A	+11,7A

$$-20 + 10i_b - i_a - 9i_c = 0$$

$$i_a = 8,33A$$

$$i_b = 13,33A$$

$$I_4 = I_5 - I_c = 1,66A$$

$$-20 + i_a + i_c = 0$$

$$i_c = 11,67A$$

$$I_5 = I_c = 11,67A$$

$$3i_a - i_c - i_b = 0$$

$$I_2 = I_5 - I_a = 5,06A$$

$$I_1 = i_a = 8,33A$$

$$I_3 = I_c - I_a = 3,34A$$

$$I_a \quad I_b \quad I_c$$

$$\begin{bmatrix} -1 & 10 & -9 \\ 1 & 0 & 1 \\ 3 & -1 & -1 \\ -1 & 10 & -9 \\ 1 & 0 & 1 \end{bmatrix}$$

$$+9 + 20 - 1 + 10 = 48$$

$$I_a \begin{bmatrix} 20 & 10 & -9 \\ 20 & 0 & 1 \\ 0 & -1 & -1 \\ 20 & 10 & -9 \\ 20 & 0 & 1 \end{bmatrix}$$

$$180 + 20 + 200 = 400$$

$$I_a = \frac{400}{48} = 8,33$$

$$I_b \begin{bmatrix} -1 & 20 & -9 \\ 1 & 20 & 1 \\ 3 & 0 & -1 \\ -1 & 20 & -9 \\ 1 & 20 & 1 \end{bmatrix}$$

$$20 + 60 + 540 + 20 = 640$$

$$I_b = \frac{640}{48} = 13,33 \text{ A}$$

$$I_c \begin{bmatrix} -1 & 10 & 20 \\ 1 & 0 & 20 \\ 3 & -1 & 0 \\ -1 & 10 & 20 \\ 1 & 0 & 20 \end{bmatrix}$$

$$-20 + 600 - 20 = 560$$

$$I_c = \frac{560}{48} = 11,67 \text{ A}$$

