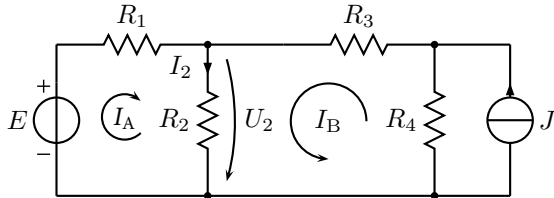


ELEC-C9610 Basics in Electronics

Calculation assignment 3. Deadline 14:00, October 5th, 2021

3.1

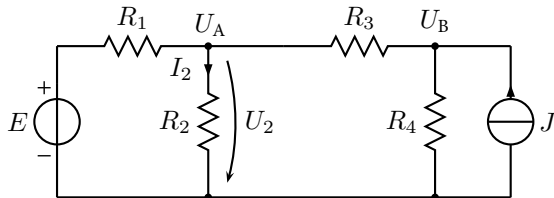


$$R_1 = 3 \Omega \quad R_2 = 6 \Omega \quad R_3 = 2 \Omega \quad R_4 = 8 \Omega$$

$$E = 9 \text{ V} \quad J = 5 \text{ A.}$$

Find the current I_2 over the resistance R_2 using the mesh current method. Formulate a linear matrix equation heuristically (see lecture slides) for loop currents I_A and I_B .

3.2

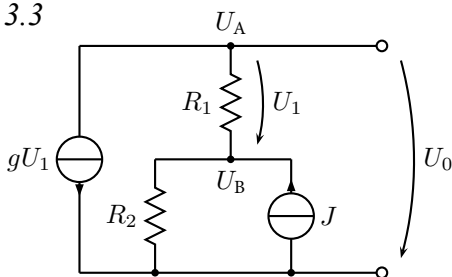


$$R_1 = 3 \Omega \quad R_2 = 6 \Omega \quad R_3 = 2 \Omega \quad R_4 = 8 \Omega$$

$$E = 9 \text{ V} \quad J = 5 \text{ A.}$$

Find the voltage U_2 over the resistance R_2 using the node voltage method. Formulate a linear matrix equation heuristically (see lecture slides) for voltages U_A and U_B . This is the same circuit as exercise 3.1. Do you get a consistent voltage value of $U_2 = I_2 R_2$ which was derived in exercise 3.1?

3.3



$$J = 1 \text{ A} \quad g = 20 \text{ mS} \quad R_1 = 10 \Omega$$

$$R_2 = 30 \Omega.$$

In this exercise, we study the treatment of dependent sources in the circuit analysis. Use the node voltage method to find the voltage U_0 . Formulate a linear matrix equation heuristically for voltages U_A and U_B .