

Homework 2

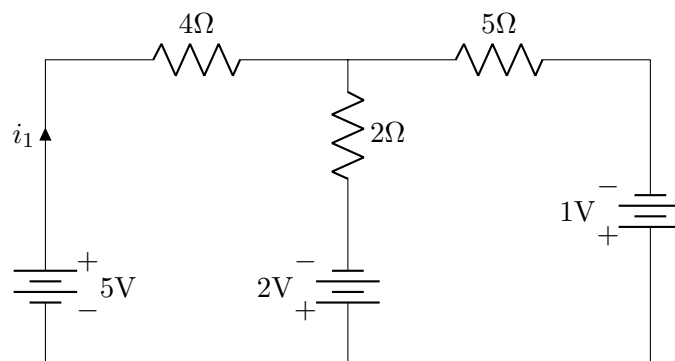
Due: Sun Aug 22, 2021 23:59

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General Instructions:

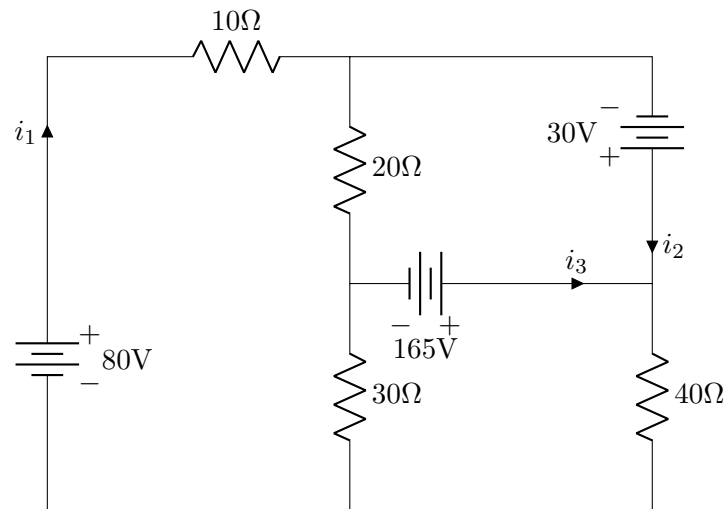
1. Submit your solutions as a *single PDF file* through Moodle. Submission via other means will not be accepted. Moodle has file size limits as well as bandwidth limits so please do not leave the task of scanning and uploading to the last minute.
2. You may create the PDF either through L^AT_EX, Word etc. or scan a clearly / legibly written sheet of paper. Answers that are not legible / readable will be marked zero. Please view/check the scanned PDF before you submit it.
3. Please attempt and submit the homework by yourself except where instructions specify group work. If you have questions, comments, doubts about any of the questions please reach out to the TAs or instructor. Do not discuss it with other students until the submission deadline. This will help regulate the pace and content of the course.

Problem 1 [5]



Problem 1

1. Analyse the circuit using mesh analysis. Annotate and label your circuit appropriately. Find all branch currents and node voltages. [3]
2. What is the power delivered (or absorbed) by each DC source? [2]

Problem 2 [15]

Problem 2

Analyse the circuit using mesh analysis.

1. Using marked currents i_1 , i_2 , and i_3 as the unknown quantities, write the system of equations for the circuit. Annotate and label your circuit appropriately. [5]
2. Write the equation in Matrix form. [5], i.e.

$$\mathbb{A} \times \begin{bmatrix} i_1 \\ i_2 \\ i_3 \end{bmatrix} = \mathbb{C}$$

where \mathbb{A} and \mathbb{C} are matrices that do not contain i_1, i_2, i_3 terms. What are the dimensions of these matrices?

3. Solve for i_1 , i_2 , and i_3 . [3]
4. What is the power delivered (or absorbed) by each DC source? [2]

Show all steps and annotate the circuit accordingly in your solution.