Homework 1

Due date:
Mar.12th, 2018
Turn in your homework in class

Rules:

- Work on your own. Discussion is permissible, but extremely similar submissions will be judged as plagiarism.
- Please show all intermediate steps: a correct solution without an explanation will get zero credit.
- Please submit on time. No late submission will be accepted.
- Please prepare your submission in English only. No Chinese submission will be accepted.

1. Determine the current flowing through an element if the charge flow is given by (a)(b). Also, find the charge flowing through an element if the current is given by (c)(d).
   (a) $\mathrm{q(t)} = 1.7\mathrm{t}(1 - \mathrm{e}^{-1.2\mathrm{t}})\ nC$
   (b) $\mathrm{q(t)} = 0.2\mathrm{t}\sin(120\pi\mathrm{t}) + \cos(2\mathrm{e}^{-\sin\mathrm{t}})\ mC$
   (c) $\mathrm{i(t)} = 4\mathrm{e}^{-\mathrm{t}} - 3e^{-2t}\ mA, q(0) = 0.2C$
   (d) $\mathrm{i(t)} = 12\mathrm{e}^{-3\mathrm{t}}\cos(40\pi t)\ nA, \mathrm{q}(0) = 2.28$ pC

2. Find the current i_1 and i_2 shown in Figure 1.

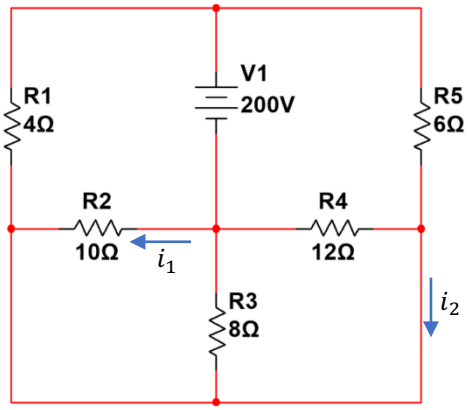

Figure 1

3. Find the power absorbed by each of the elements from p_1 to p_5 with the following circuit shown in Figure 2.

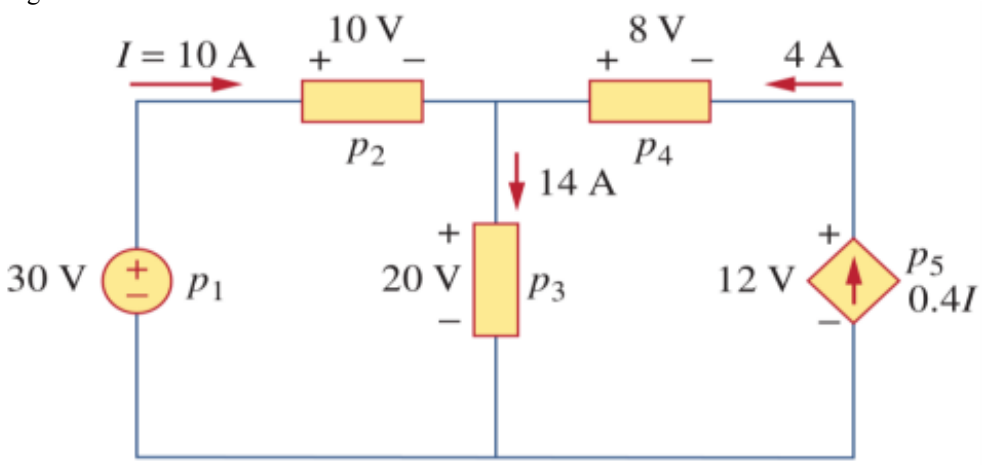

Figure 2

4. Find i_1, i_6, v *and power on the voltage source of* $8V$ with the circuit shown in the Figure 3.

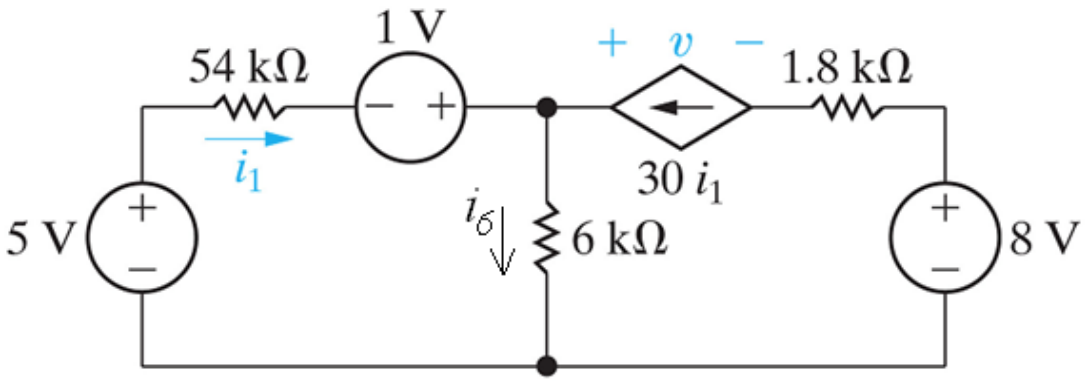

Figure 3

5. Use nodal analysis to find V_0 in the circuit of Figure 4.

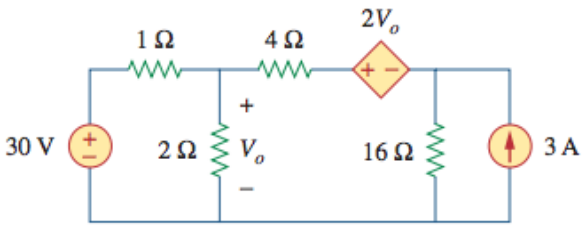

Figure 4

6. Apply mesh analysis to find I_X in the circuit of Figure 5.

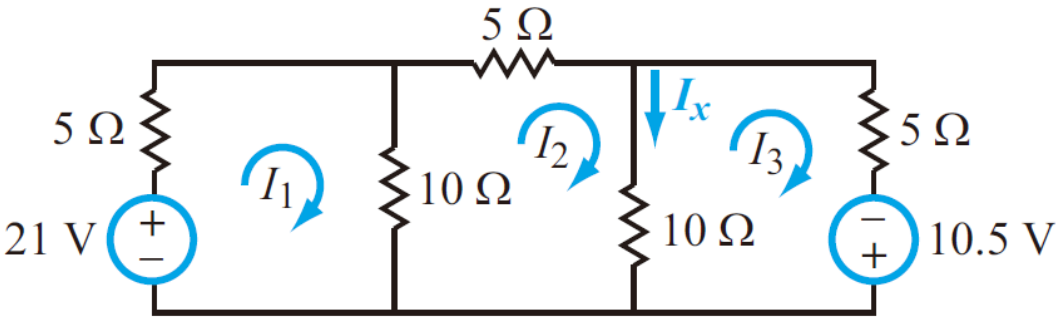

Figure 5

7. Determine **A** if $V_{out}/V_S = 9$ in the circuit of Figure 6.

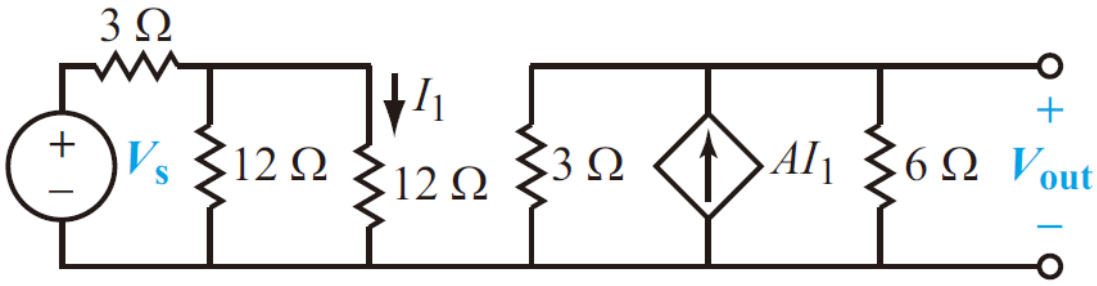

Figure 6