Homework #3

MEMS 0031 - Electrical Circuits

Assigned January 26th, 2018
Due February 2nd, 2018

Problem #1

- Use voltage division for series resistors to determine the voltages v_1 through v_4 for the circuit shown in Fig. 1.
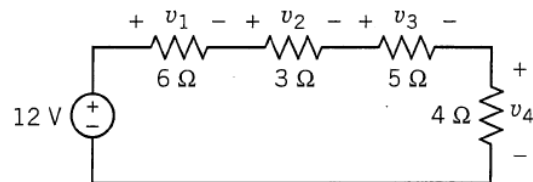

Figure 1: Schematic for Problem #1.

Problem #2

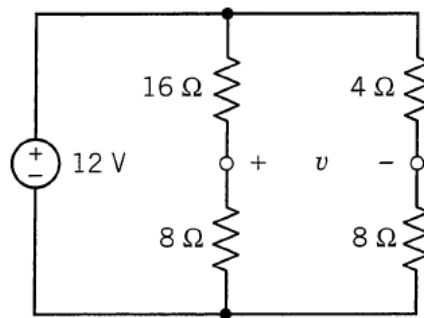- Determine the voltage drop v across the circuit as shown in Fig. 2.

Figure 2: Schematic for Problem #2.

Problem #3

- Using KVL, determine the voltage drop v across the 10 [Ω] resistor shown in Fig. 3.
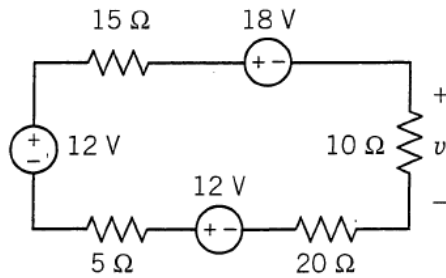

Figure 3: Schematic for Problem #3.

Problem #4

- Using current division (KCL), determine the currents i_1 through i_4 in the circuit shown in Fig. 4.
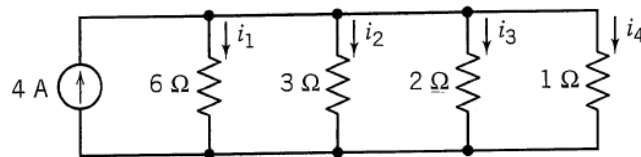

Figure 4: Schematic for Problem #4.

Problem #5

- Determine the equivalent resistance R in the circuit shown in Fig. 5, as well as the voltage drop v across the equivalent resistance.
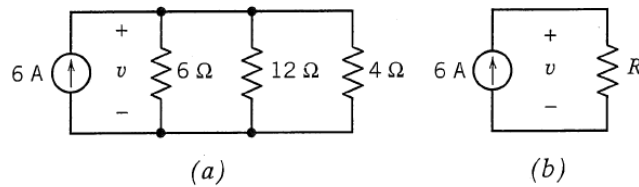

Figure 5: Schematic for Problem #5.

Problem #6

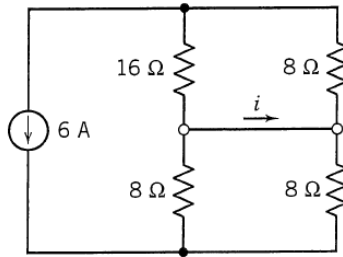• Determine the current i in the circuit shown in Fig. 6.

Figure 6: Schematic for Problem #6.

Problem #7

• Determine the values for v_1, v_2, i_3, v_4, v_5 and i_6.
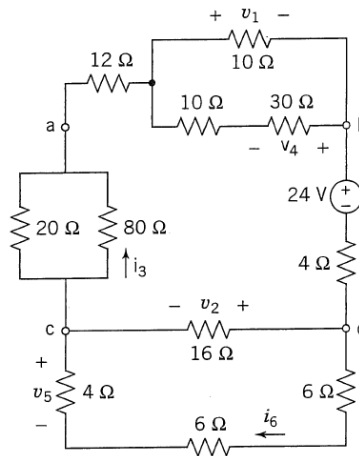

Figure 7: Schematic for Problem #7.

Problem #8

• An automobile cigarette lighter is provided with 15 [VDC] (volts direct current). You are designing a cigarette-lighter based cell phone charger. The cell phone charger must provide 5.1 [VDC] to the phone, which draws 850 [mA]. Design a resistor network that provides the proper voltage and current to the phone. Note: you will have a voltage source, either series, parallel or a combination of both resistors, and the phone can be modeled as a resistor.