TJ TUTORS

PHY 122

TUTORIAL 2.

DIRECT CURRENT CIRCUITS

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Instructions

1. Answer all the questions
2. Show your work clearly
3. Verify your work with the Infinity Tutors

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1. The current in a loop circuit that has a resistance of R_1 is 2.00 A. The current is reduced to 1.60 A when an additional resistor $R_2 = 3.00\,\Omega$ is added in series with R_1 . What is the value of R_1 ? [5]

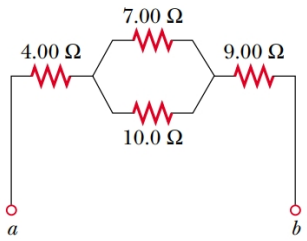

Figure 1: Electric circuit

2. (a) Find the equivalent resistance between points a and b in Figure 1 [5]
   (b) Calculate the current in each resistor if a potential difference of 34.0 V is applied between points a and b.

3. Consider the circuit shown in Figure 2. Find (a) the current in the 20.0 Ω resistor and (b) the potential difference between points a and b. [6]

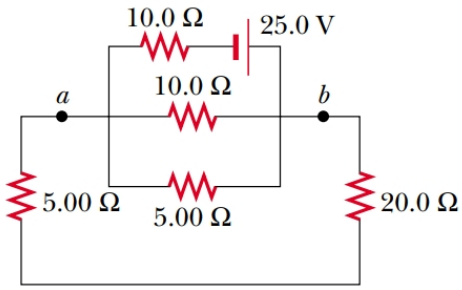

Figure 2:

4. Three $100\,\Omega$ resistors are connected as shown in Figure 3. The maximum power that can safely be delivered to any one resistor is $25.0\,W$. (a) What is the maximum voltage that can be applied to the terminals a and b? (b) For the voltage determined in part (a), what is the power delivered to each resistor? What is the total power delivered? [6]

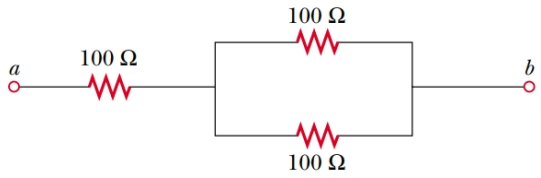

Figure 3:

5. Using Kirchhoff's rules, find the current in each resistor shown in Figure 4 and (b) find the potential difference between points c and f. Which point is at the higher potential? [8]

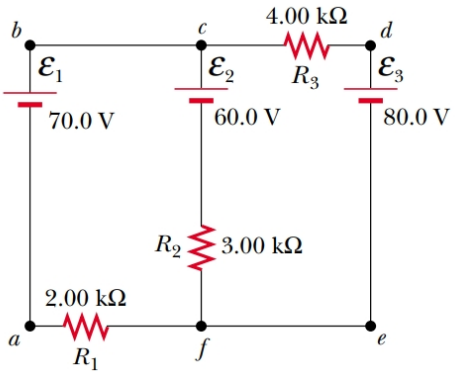

Figure 4:

6. Determine the current in each branch of the circuit shown in Figure 5. [8]

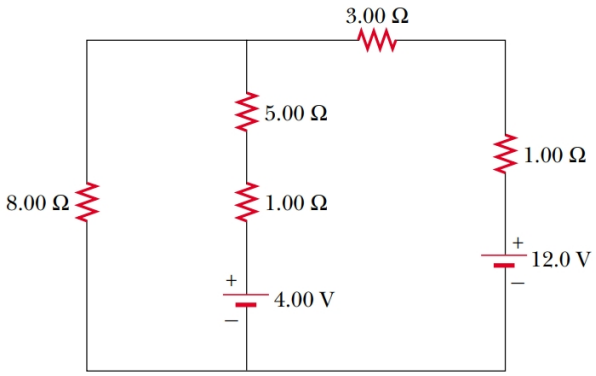

Figure 5:

7. In the circuit of Figure 6, determine the current in each resistor and the voltage across the 200 Ω resistor. [10]

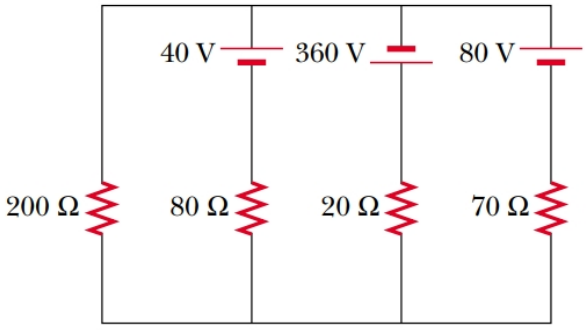

Figure 6:

8. Find the current in the 12-V resistor in Figure 7. [8]

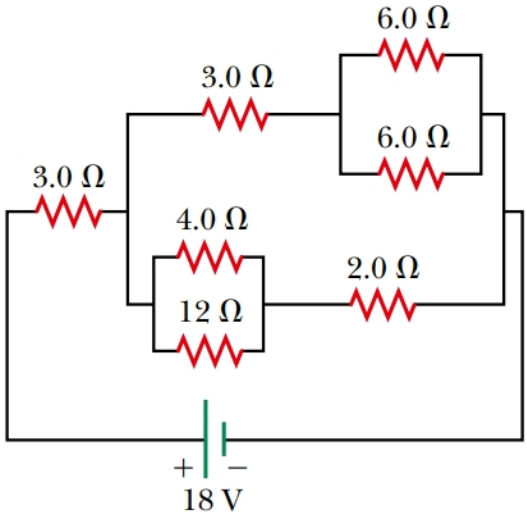

Figure 7:

9. For the circuit shown in Figure 8, calculate (a) the current in the 2.00-V resistor and (b) the potential difference between points a and b, $\Delta V = V_b - V_a$. [7]

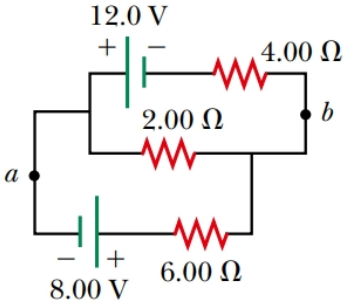

Figure 8:

10. In the circuit of Figure 9, the current I_1 is 3.0 A and the values of ε and R are unknown. What are the currents I_2 and I_3 ? [8]

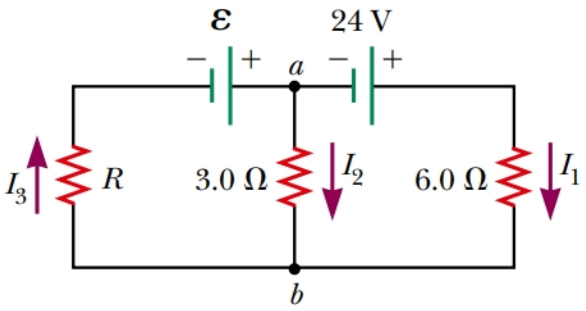

Figure 9:

"Measure what can be measured, and make measurable what cannot be measured" Galileo Galilei.