Problems

SECTION 5–1 THE APPLIED VOLTAGE V_A IS THE SAME ACROSS PARALLEL BRANCHES

5–1 MultiSim In Fig. 5–19, how much voltage is across points

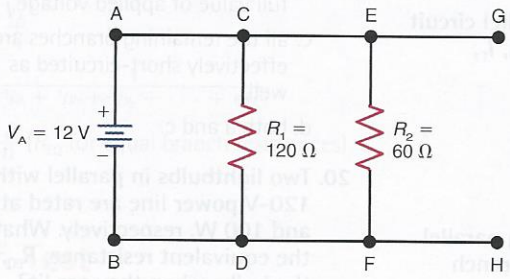
a. A and B?

b. C and D?

c. E and F?

d. G and H?

Figure 5–19



5–2 In Fig. 5–19, how much voltage is across

a. the terminals of the voltage source?

b. R_1?

c. R_2?

5–3 In Fig. 5–19, how much voltage will be measured across points C and D if R_1 is removed from the circuit?

SECTION 5–2 EACH BRANCH I EQUALS $\frac{V_A}{R}$

5–4 In Fig. 5–19, solve for the branch currents, I_1 and I_2.

5–5 In Fig. 5–19, explain why I_2 is double the value of I_1.

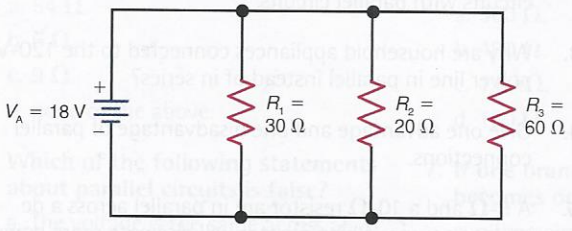
5–6 In Fig. 5–19, assume a 10-Ω resistor, R_3, is added across points G and H.

a. Calculate the branch current, I_3.

b. Explain how the branch currents, I_1 and I_2 are affected by the addition of R_3.

5–7 In Fig. 5–20, solve for the branch currents I_1, I_2, and I_3.

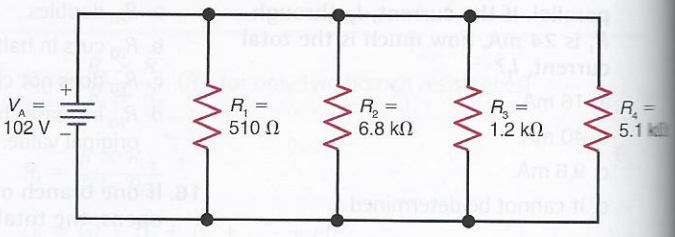
Figure 5–20



5–8 In Fig. 5–20, do the branch currents I_1 and I_3 remain the same if R_2 is removed from the circuit? Explain your answer.

5–9 In Fig. 5–21, solve for the branch currents I_1, I_2, I_3, and I_4.

Figure 5–21



5–10 Recalculate the values for I_1, I_2, I_3, and I_4 in Fig. 5–21 if the applied voltage, V_A, is reduced to 51V.

SECTION 5–3 KIRCHHOFF'S CURRENT LAW (KCL)

5–11 MultiSim In Fig. 5–19, solve for the total current, I_T.

5–12 MultiSim In Fig. 5–19 re-solve for the total current, I_T, if a 10-Ω resistor, R_3, is added across points G and H.

5–13 In Fig. 5–20, solve for the total current, I_T.

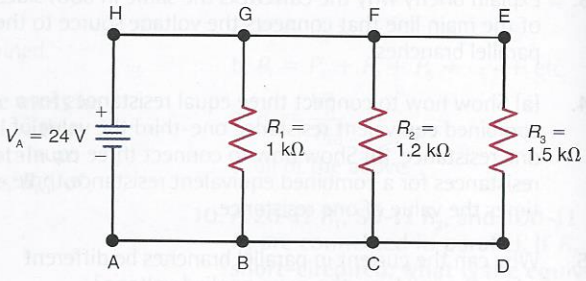
5–14 In Fig. 5–20, re-solve for the total current, I_T, if R_2 is removed from the circuit.

5–15 In Fig. 5–21, solve for the total current, I_T.

5–16 In Fig. 5–21, re-solve for the total current, I_T, if V_A is reduced to 51 V.

5–17 In Fig. 5–22, solve for I_1, I_2, I_3, and I_T.

Figure 5–22



5–18 In Fig. 5–22, how much is the current in the wire between points

a. A and B?

b. B and C?

c. C and D?

d. E and F?

e. F and G?

f. G and H?