4–50 In Fig. 4–47, assume R_1 becomes open. How much is
a. the total resistance, R_T?
b. the series current, I?
c. the voltage across each resistor, R_1, R_2, and R_3?

4–51 In Fig. 4–47, assume R_3 shorts. How much is
a. the total resistance, R_T?
b. the series current, I?
c. the voltage across each resistor, R_1, R_2, and R_3?

4–52 In Fig. 4–47, assume that the value of R_2 has increased but is not open. What happens to
a. the total resistance, R_T?
b. the series current, I?
c. the voltage drop across R_2?
d. the voltage drops across R_1 and R_3?

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4–53 Three resistors in series have a total resistance R_T of 2.7 kΩ. If R_2 is twice the value of R_1 and R_3 is three times the value of R_2, what are the values of R_1, R_2, and R_3?

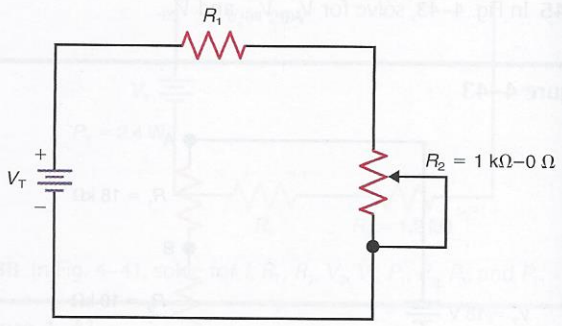
4–54 Three resistors in series have an R_T of 7 kΩ. If R_3 is 2.2 times larger than R_1 and 1.5 times larger than R_2, what are the values of R_1, R_2, and R_3?

4–55 A 100-Ω, ⅛-W resistor is in series with a 330-Ω, ½-W resistor. What is the maximum series current this circuit can handle without exceeding the wattage rating of either resistor?

4–56 A 1.5-kΩ, ½-W resistor is in series with a 470-Ω, ¼-W resistor. What is the maximum voltage that can be applied to this series circuit without exceeding the wattage rating of either resistor?

4–57 Refer to Fig. 4–48. Select values for R_1 and V_T so that when R_2 varies from 1 kΩ to 0 Ω, the series current varies from 1 to 5 mA. V_T and R_1 are to have fixed or constant values.

Figure 4–48 Circuit diagram for Critical Thinking Prob. 4–57.



Troubleshooting Challenge

Table 4–1 shows voltage measurements taken in Fig. 4–49. The first row shows the normal values that exist when the circuit is operating properly. Rows 2 to 15 are voltage measurements taken when one component in the circuit has failed. For each row, identify which component is defective and determine the type of defect that has occurred in the component.

Figure 4–49 Circuit diagram for Troubleshooting Challenge. Normal values for V_1, V_2, V_3, V_4, and V_5 are shown on schematic.