Add the measured values of V_1, V_{AB}, and V_4. Record your answer.

How does this value compare to the value of V_T? Does the sum of these voltages satisfy KVL?

Series-Parallel Circuit Troubleshooting

When troubleshooting a faulty electronic circuit, seldom will you calculate the exact voltage you should measure across any given component. You should know what the circuit voltages are supposed to be when it is operating normally. In this troubleshooting assignment you will insert faults into the series-parallel circuit of Fig. 6–51. However, you will not be asked to calculate every voltage for every possible defect. All you will be asked to do is insert the fault specified in Table 6–2 and record the measured values for V_1, V_2, V_3, V_4, and V_5. To simulate a short, replace the original resistor with a 1-Ω resistor. To simulate an open, replace the original resistor with a 1-MΩ resistor. Although you will already know which component is defective, this exercise gives you practical hands-on experience in analyzing the effects of opens and shorts in series-parallel circuits. Let's get started.

Refer to Fig. 6–51. Calculate the normal values for V_1, V_2, V_3, V_4, and V_5. Write each voltage value next to its respective resistor on the schematic diagram. Next, use a DMM to measure V_1, V_2, V_3, V_4, and V_5. Record these values in Table 6–2 in the first row labeled "Normal." Next, open R_1 (replace it with a 1-MΩ resistor) and measure the voltages V_1, V_2, V_3, V_4, and V_5. Record these values in the second row of the table. Repeat this procedure for each fault listed in Table 6–2.

Figure 6–51

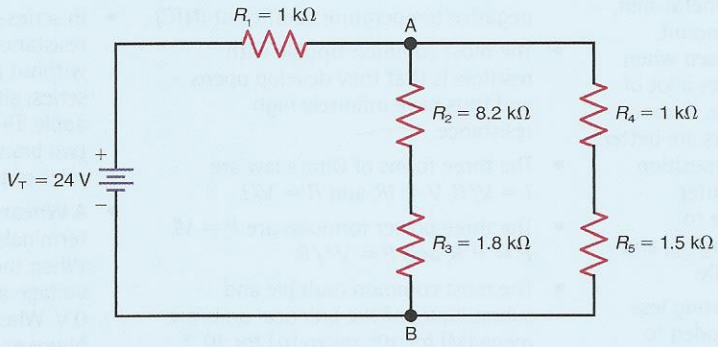

Table 6–2 Series-Parallel Circuit Troubleshooting

V_1	V_2	V_3	V_4	V_5	Circuit Fault
					Normal
					R_1 open
					R_1 shorted
					R_2 open
					R_2 shorted
					R_3 open
					R_3 shorted
					R_4 open
					R_4 shorted
					R_5 open
					R_5 shorted