## Section 2-10 How Can We Check…?

**P 2.10-1** The circuit shown in Figure P 2.10-1 is used to test the CCVS. Your lab partner claims that this measurement shows that the gain of the CCVS is –20 V/A instead of +20 V/A. Do you agree? Justify your answer.

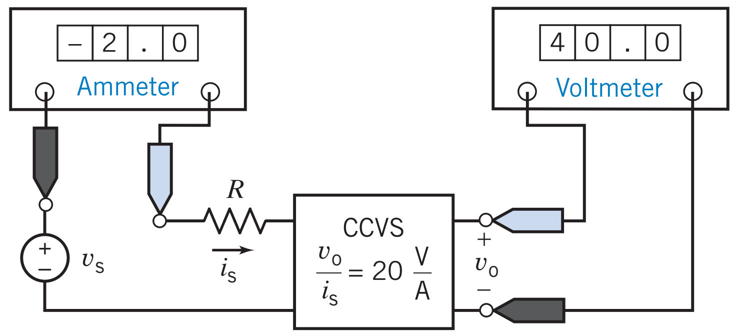


**Figure P 2.10-1**

**Solution:**

$v_o$=40 V and $i_s = -(-2) = 2$ A. (Notice that the ammeter measures $-i_s$ rather than $i_s$.)

So $$\frac{v_o}{i_s} = \frac{40}{2} = 20\ \frac{\text{V}}{\text{A}}$$

Your lab partner is wrong.

**P 2.10-2** The circuit of Figure P 2.10-2 is used to measure the current in the resistor. Once this current is known, the resistance can be calculated as $R = \frac{v_s}{i}$. The circuit is constructed using a voltage source with $v_s$ = 12 V and a 25-Ω, 1/2-W resistor. After a puff of smoke and an unpleasant smell, the ammeter indicates that $i$ = 0 A. The resistor must be bad. You have more 25-Ω, 1/2-W resistors. Should you try another resistor? Justify your answer.

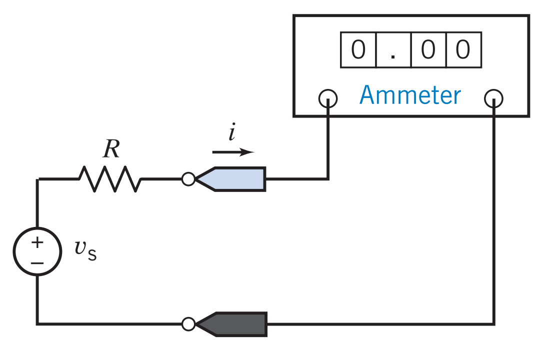


**Figure P 2.10-2**

***Hint:*** 1/2-W resistors are able to safely dissipate one 1/2 W of power. These resistors may fail if required to dissipate more than 1/2 watt of power.

**Solution:**

We expect the resistor current to be $i = \frac{v_s}{R} = \frac{12}{25} = 0.48$ A. The power absorbed by this resistor will be $P = i\ v_s = (0.48)\ (12) = 5.76$ W.

A half watt resistor can't absorb this much power. You should not try another resistor.