Physics 12: Circuit Practice (Internal Resistance)

1. Determine the terminal voltage of this battery. ξ=3.0V

r=0.80Ω

2.0A

2. Determine the e.m.f. of this battery.

0.600Ω

1.20A

9.28V

3. A battery has a terminal voltage of 4.4V and an emf of 5.0V. What is the potential loss due to the internal resistance?

4. The terminal voltage of a battery with an emf of 1.50V and an internal resistance of 0.750Ω is 1.41V. How much current flows through the battery?

5. Find the terminal voltage of this battery. ξ=3.0V

r=0.80Ω

2.0A

6. A battery has a terminal voltage of 4.6V when providing 1.2A of current. The same battery has a terminal voltage of 4.8V when providing 0.60A of current. Find the emf and internal resistance of the battery.

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7.

18Ω 4.0Ω 12Ω

6.0Ω

The battery in the circuit above has an emf of 14V and an internal resistance of 1.0Ω.

a. Find the total EXTERNAL resistance of the circuit (the resistance not including the internal resistance).

b. Find the total resistance including the internal resistance.

c. Find the current leaving the battery.

d. Find the terminal voltage of the battery.

8. The battery in the circuit below has an emf of 2.0V and an internal resistance of 0.50Ω. If each resistor in the circuit (outside of the battery) has a value of 2.00Ω, find the following:

a. The terminal voltage with the switch open.

b. The terminal voltage with the switch closed.

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18Ω 4.0Ω 12Ω

6.0Ω

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a. Find the total EXTERNAL resistance of the circuit (the resistance not including the internal resistance).

b. Find the total resistance including the internal resistance.

c. Find the current leaving the battery.

d. Find the terminal voltage of the battery.

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b. The terminal voltage with the switch closed.