PH 102 / LeClair   Summer II 2009

Problem Set 3: Electrical Energy

Instructions:

1. Answer all questions below. Show your work for full credit.
2. Due before the end of the day, 17 July 2009
3. Email: leclair.homework@gmail.com; hard copies: Gallalee 110 or Bevill 228.
4. You may collaborate, but everyone must turn in their own work

1. If the voltage at the terminals of an automobile battery drops from 12.3 to 9.8 V when a 0.5 Ω resistor is connected across the battery, what is the internal resistance of the battery?

2. Are the two headlights of a car wired in series or in parallel? How can you tell?

3. What advantage might there be in using two identical resistors in parallel connected in series with another identical parallel pair, rather than just using a single resistor?

4. A dead battery is charged by connecting it to the live battery of another car with jumper cables (see below). Determine the current in the starter and in the dead battery.
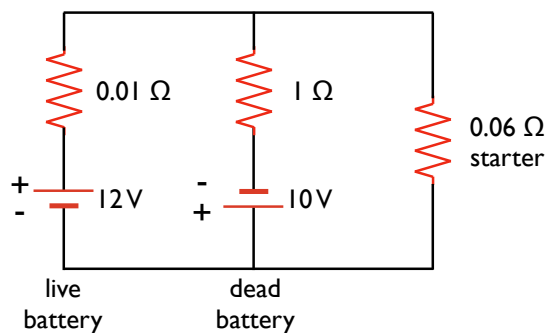
5. Two resistors connected in series have an equivalent resistance of 900 Ω. When they are connected in parallel, their equivalent resistance is 180 Ω. Find the resistance of each resistor.