

23 Electric Current

Solutions to Chapter 23 Exercises

7. Normally a current-carrying wire is not electrically charged because for every electron in the wire is a proton in the material. A wire can be charged, but ordinarily wires are not charged.
19. Thick wires have less resistance and will more effectively carry currents without excessive heating.
28. Auto headlights are wired in parallel. Then when one burns out, the other remains lit. If you've ever seen an automobile with one burned out headlight, you have evidence they're wired in parallel.
33. Current remains the same in all the resistors in a series circuit.
34. Voltage across parallel branches, whatever the resistance, remains the same.
44. Brightness remains the same.

Chapter 23 Problem Solutions

1. From "Power = current \times voltage," 60 watts = current \times 120 volts, current = $\frac{60\text{W}}{120\text{V}}$
= **0.5 A**.

2. From current = $\frac{\text{voltage}}{\text{resistance}}$, resistance = $\frac{\text{voltage}}{\text{current}}$ = $\frac{120\text{V}}{20\text{A}}$ = **6 Ω** .