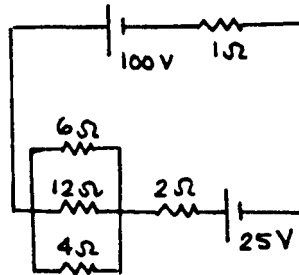# Challenge Exercises for Further Study

B-1: An 800.-W submersible electric heater is put into a 20.0 °C hottub until the 50.0-kg of tub water has warmed up to 70.0 °C. How long will it take for the heater to heat the tub water? (c_{water} = 4187 J/kg°C)

B-2: Find the total current in the circuit in the diagram.

B-3: In exercise A-10, the light bulbs are rated for 5 h of use before they burn out. If the battery can supply 5184 J to the circuit, which occurs first, energy depletion in the battery or failure of a bulb?