Prof. Anchordoqui

Problems set # 6 **Physics 167** March 21, 2023

1. Find the current I in the circuit shown Fig. 1.

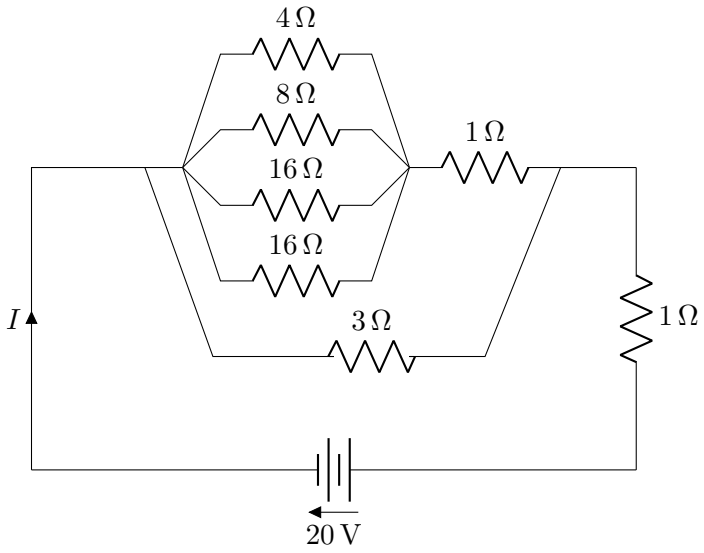

Figure 1: Problem 1.

2. In the circuit shown in Fig. 2, the power produced by bulb_1 and bulb_2 is 1 kW and 50 W, respectively. Which light has the higher resistance? (Assume the resitance of the light bulb remains constant with time.)

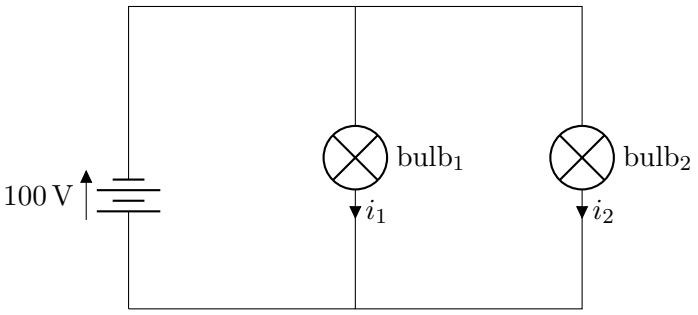

Figure 2: Problem 2.

3. A regular tetrahedron is a pyramid with a triangular base. Six $R = 10.0\ \Omega$ resistors are placed along its six edges, with junctions at its four vertices, as shown in Fig. 3. A 12.0-V battery is connected to any two of the vertices. Find *(i)* the equivalent resistance of the tetrahedron between these vertices and *(ii)* the current in the battery.

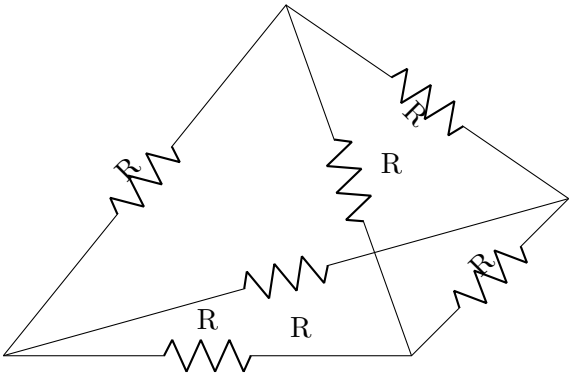

Figure 3: Problem 3.

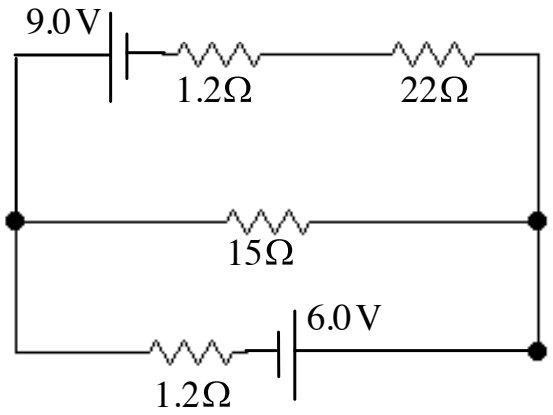

Figure 4: Problem 4.

4. Determine the magnitude and directions of the currents through $R_1 = 22\ \Omega$ and $R_2 = 15\ \Omega$ in the circuit of Fig. 4. The batteries have an internal resistance of $r = 1.2\ \Omega$.

5. Determine the magnitude and directions of the currents in each resistor shown in Fig. 5. The batteries has emfs of $\varepsilon_1 = 9$ V and $\varepsilon_2 = 12$ V and the resistors have values of $R_1 = 25\ \Omega$, $R_2 = 18\ \Omega$, and $R_3 = 35\ \Omega$.

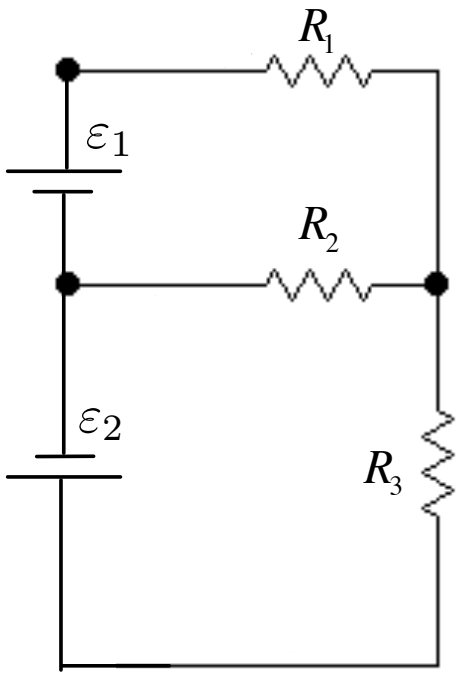

Figure 5: Problem 5.