Electrical power and potential divider

1. A 60W light bulb is connected to the 220V mains (in Europe). Calculate the current that will flow through it.

\[ P = IV \Rightarrow I = \frac{P}{V} = \frac{60}{220} = 0.27 \text{ A} \]

2. Calculate the power dissipated in the internal resistance in the following circuit.

Total resistance = 6 Ω
\[ I = \frac{V}{R} = \frac{6}{6} = 1 \text{ A} \]
\[ P = I^2R = 1^2 \times 1 = 1 \text{ W} \]

3. Calculate the value of \( v \) for the potential divider in the diagram.

Total resistance = 60 Ω
\[ I = \frac{V}{R} = \frac{60}{60} = 0.1 \text{ A} \]
\[ V = IR = 0.1 \times 50 = 5 \text{ V} \]
(of ratios)

4. The diagram shows a combination of bulbs. Explain what would happen to the brightness of A, B, and D if C was unscrewed.

Total number more \( \Rightarrow \) current in oct less
\( \Rightarrow \) current thru' D less \( \Rightarrow \) D less bright

No current thru' B \( \Rightarrow \) B off.
More current thru' A \( \Rightarrow \) A brighter