

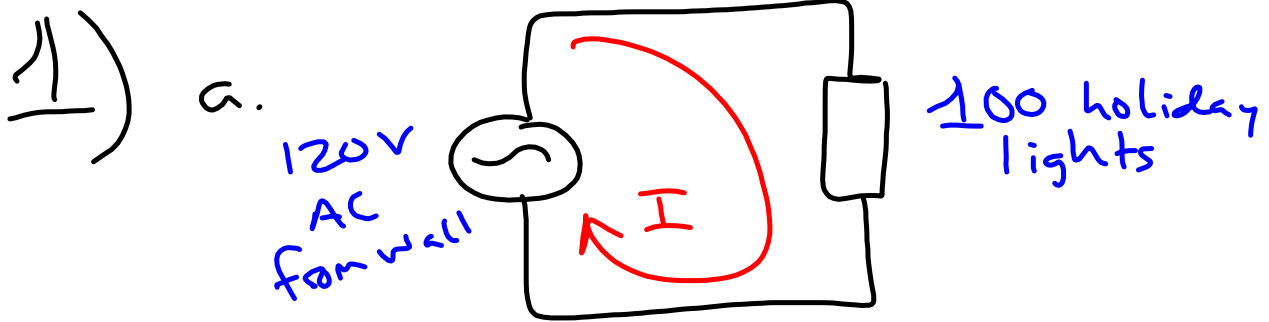
ELECTRIC POWER

$$P = IV$$

charger $P = (1A)(5V) = 5W$

$$P = I^2 R = \frac{V^2}{R}$$

POWER CHALLENGE



$$P = 40 \text{ W}$$

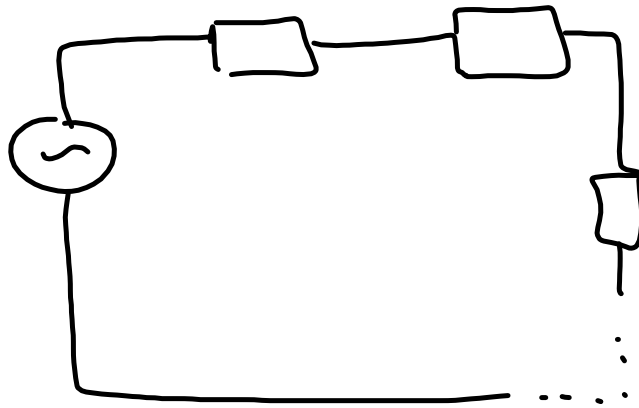
b. $P = \frac{V^2}{R}$

$$R_{\text{total}} = \frac{V^2}{P} = \frac{(120\text{V})^2}{40\text{W}} = 360\Omega$$

$$R_{\text{individual}} = \frac{360\Omega}{100} = 3.6\Omega$$

c. $I = \frac{V}{R_{\text{total}}} = \frac{120\text{V}}{360\Omega} = 0.3 \text{ A}$

d.



$$I \geq 0.018 \text{ A}$$

$$R_{\text{individual}} = 360 \Omega \text{ for each}$$

$$V = 120 \text{ V}$$

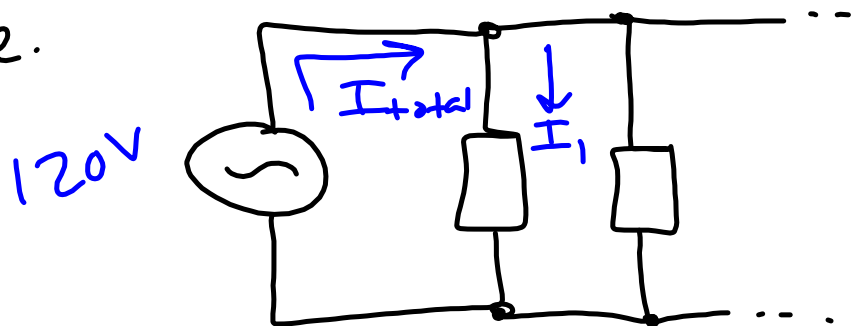
$$R = \frac{V}{I}$$

$$= \frac{120 \text{ V}}{0.018 \text{ A}}$$

$$= 6666 \Omega$$

$$\# \text{ strands} = \frac{6666 \Omega}{360 \Omega} = 18.5 \text{ strands}$$

e.



$$I_{total} \leq 15A$$

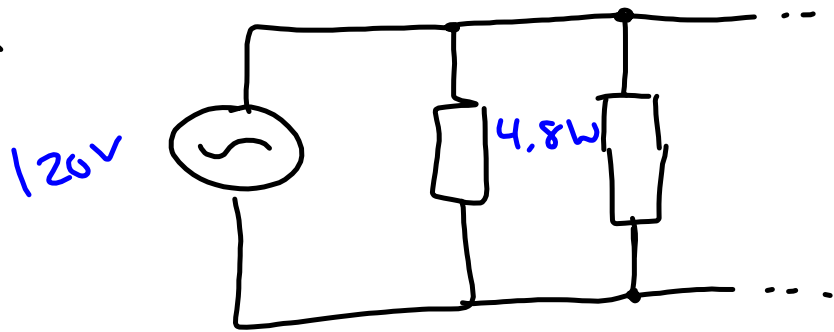
$$R = 360\Omega$$

$$V = 120V$$

$$I = \frac{V}{R} = 0.33A$$

$$\# \text{ Strands} = \frac{I_{total}}{I_{individual}} = \frac{15A}{0.33A} = 45 \text{ strands}$$

f.



$$R = \frac{V^2}{P} = \frac{(120V)^2}{4.8W} = 3000\Omega$$

$$I = \frac{120V}{3000\Omega} = 0.04A$$

$$\# \text{ strands} = \frac{15A}{0.04A} = 375 \text{ strands}$$