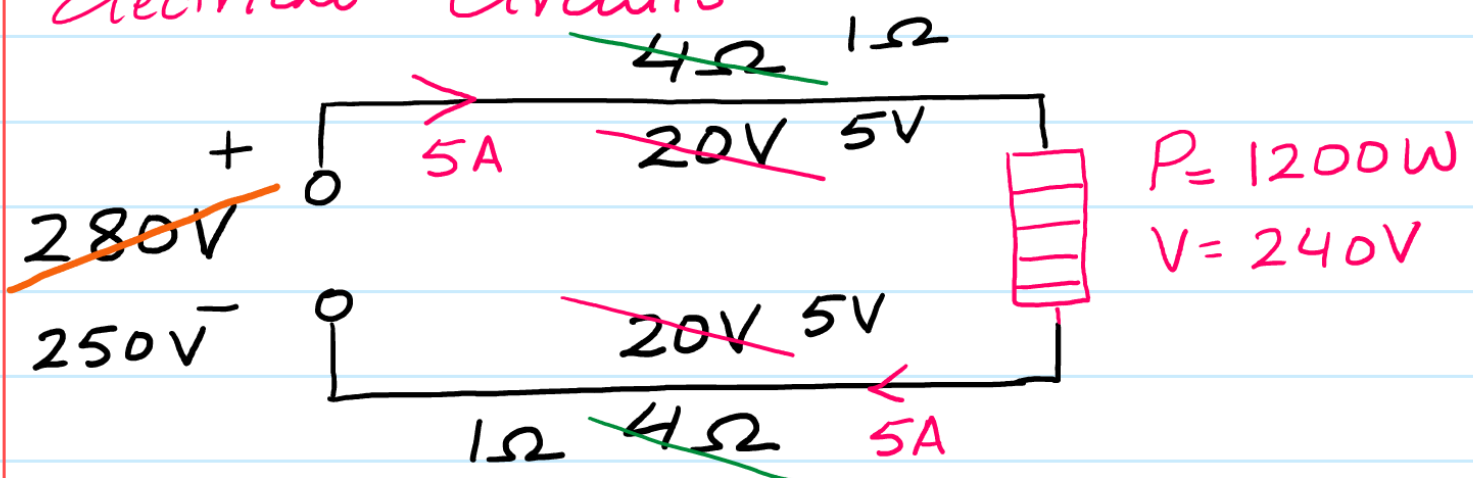


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How to calculate efficiency in Electrical Circuits



(i) Cal. Current supplied to the heater.

$$P = IV$$

$$1200 = I(240) \quad \therefore \boxed{I = 5A}$$

(ii) Cal. the voltage across both the connecting wires

$$V = IR$$

$$V = (5)(4)$$

$$V = 20V$$

$$\therefore \boxed{40V}$$

(iii) Cal the voltage supplied by the Power Supply for the heater to operate at its normal Capacity

$$240 + 20 + 20 = 280V$$

(iv) efficiency  $\frac{240}{280} \times 100 = 85.7\%$

(v) How can the efficiency be improved

(i) By using THICKER connecting wires

diameter = double

Area =  $\times 4$

Resistance =  $\frac{1}{4}$ th (i.e.  $4\Omega \rightarrow 1\Omega$ )

$$\text{new efficiency} = \frac{240}{250} \times 100$$

$$= 96\% \quad \text{more efficiency}$$

Other advantages

① Less wear & tear

② will NOT melt easily due to overheating.

disadvantage

① not very cost effective