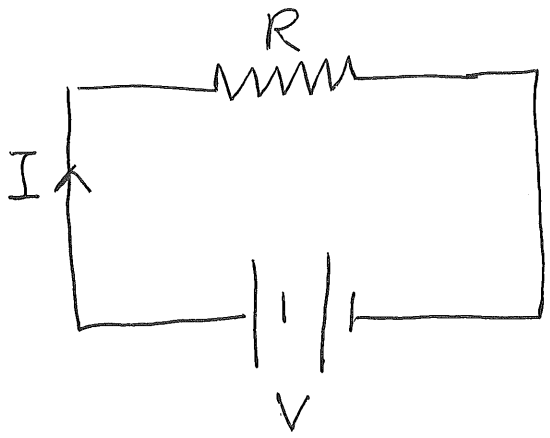
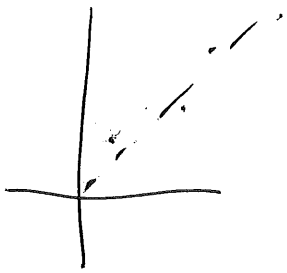
Ohm's Law.



$\Rightarrow V = IR$ or $\vec{J} = \sigma \vec{E}$

V	I
2V	30mA
4V	72mA.
6V	115mA
8V	155mA
10V	200mA.



$$R = \frac{V}{I} = \frac{10\,V}{200\,mA} = \frac{10}{0.2} = 50\,\Omega$$

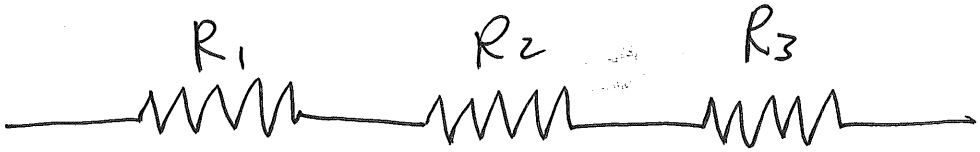
$W = QV$

$$P = \frac{W}{t} = \frac{Q}{t}V = IV \leftarrow$$

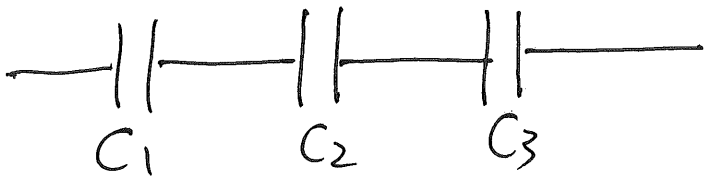
$$= I^2R$$

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

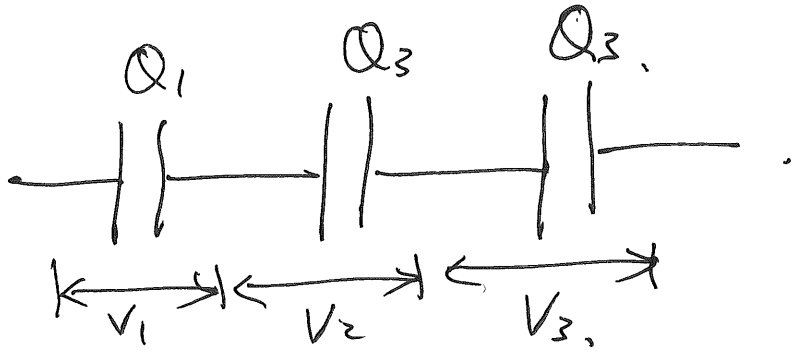
Resistors in series.



$$R_{eff} = R_1 + R_2 + R_3$$



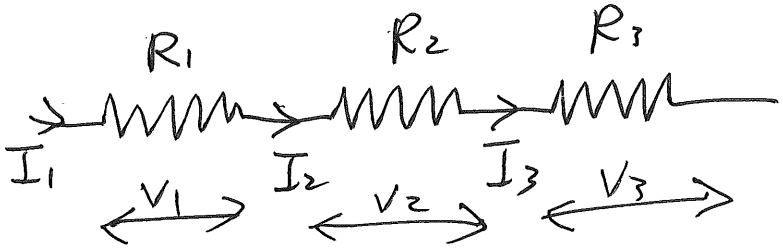
$$\frac{1}{C_{eff}} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}.$$



$$Q_1 = Q_2 = Q_3 = Q_{eff}$$

$$V_1 \neq V_2 \neq V_3 \neq V_{eff}$$ ~~$V = V_1$~~

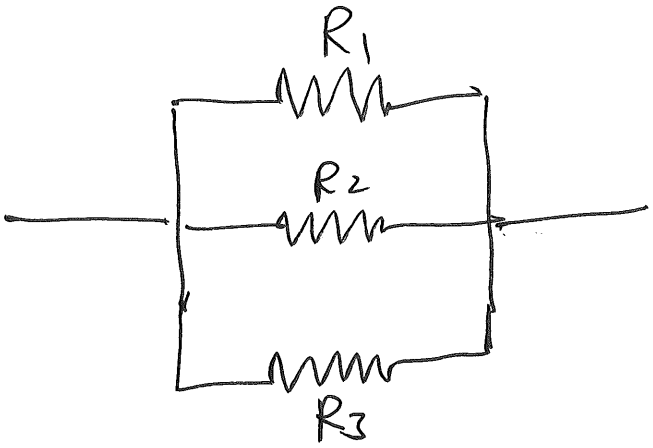
$$V_{eff} = V_1 + V_2 + V_3 .$$



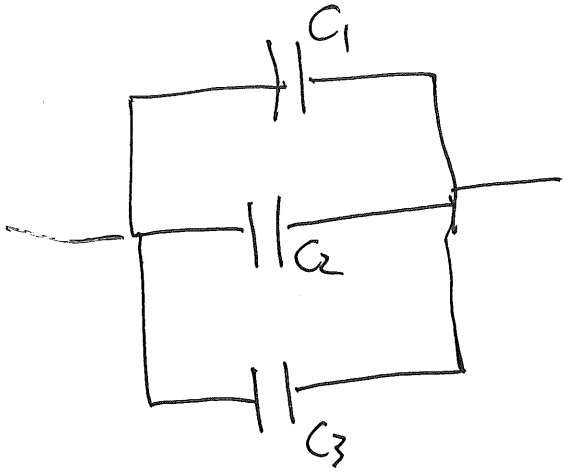
$$I_1 = I_2 = I_3 = I_{eff}$$

$$V_1 \neq V_2 \neq V_3 \neq V_{eff}$$

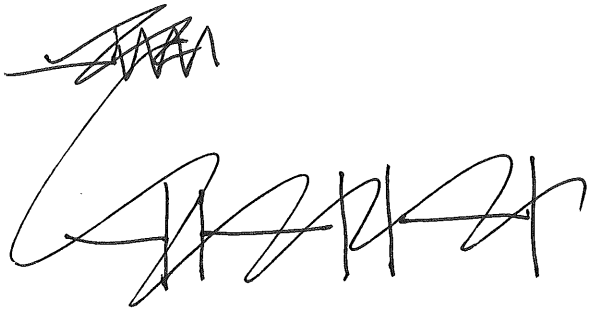
$$V_{eff} = V_1 + V_2 + V_3 .$$

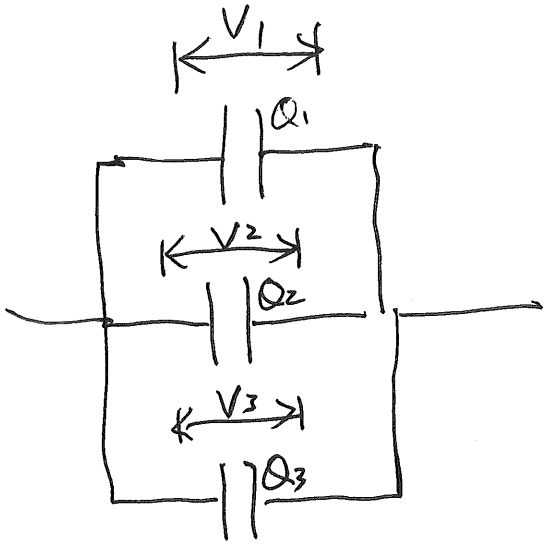


$$\frac{1}{R_{eff}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$



$$\text{If } C_{eff} = C_1 + C_2 + C_3.$$

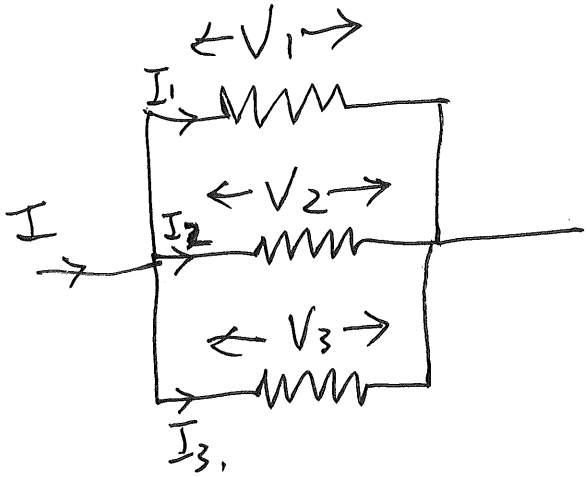




$$V_1 = V_2 = V_3 = V_{eff}$$

$$Q_1 \neq Q_2 \neq Q_3 \neq Q_{eff}$$

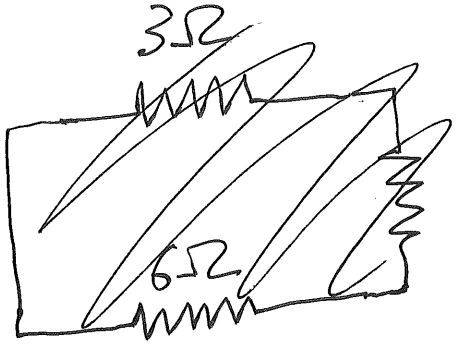
$$Q_{eff} = Q_1 + Q_2 + Q_3$$



$$V_1 = V_2 = V_3 = V_{eff}$$

$$I_1 \neq I_2 \neq I_3 \neq I_{eff}$$

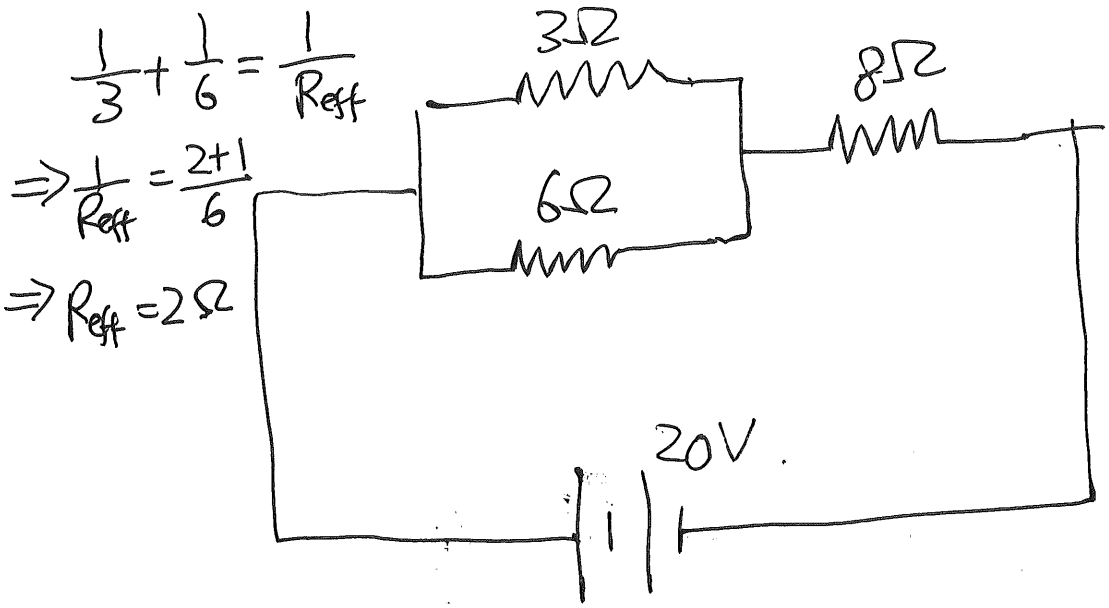
$$I_{eff} = I_1 + I_2 + I_3$$

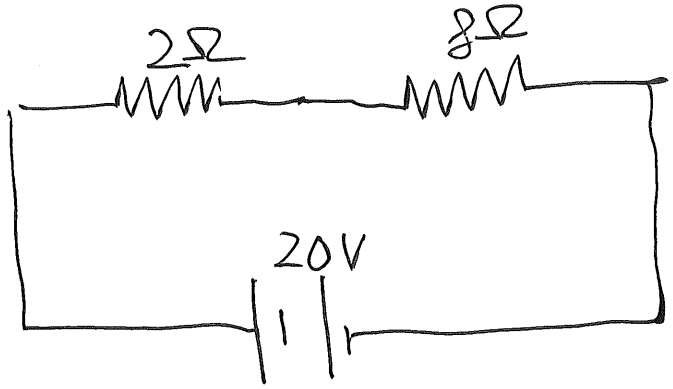


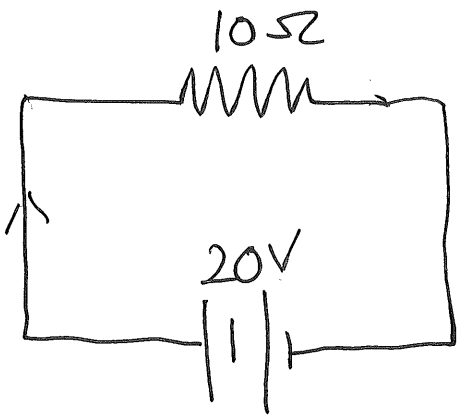
$$\frac{1}{3}+\frac{1}{6}=\frac{1}{R_{eff}}$$

$$\Rightarrow \frac{1}{R_{eff}}=\frac{2+1}{6}$$

$$\Rightarrow R_{eff}=2\Omega$$







$I = \frac{20}{10}$

$= 2A.$

Total power dissipated

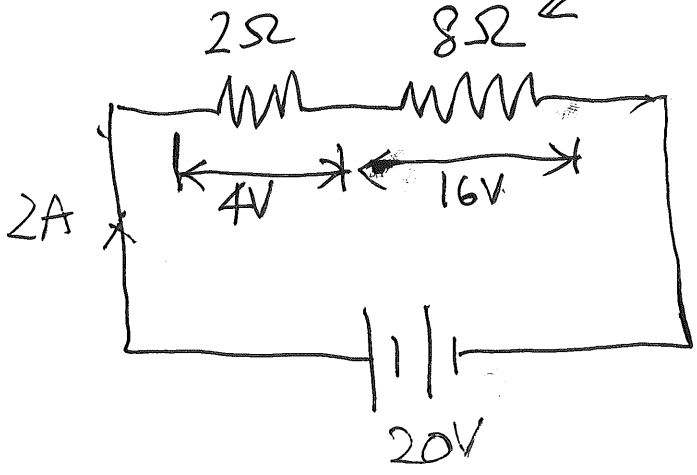
$= I^2 R.$

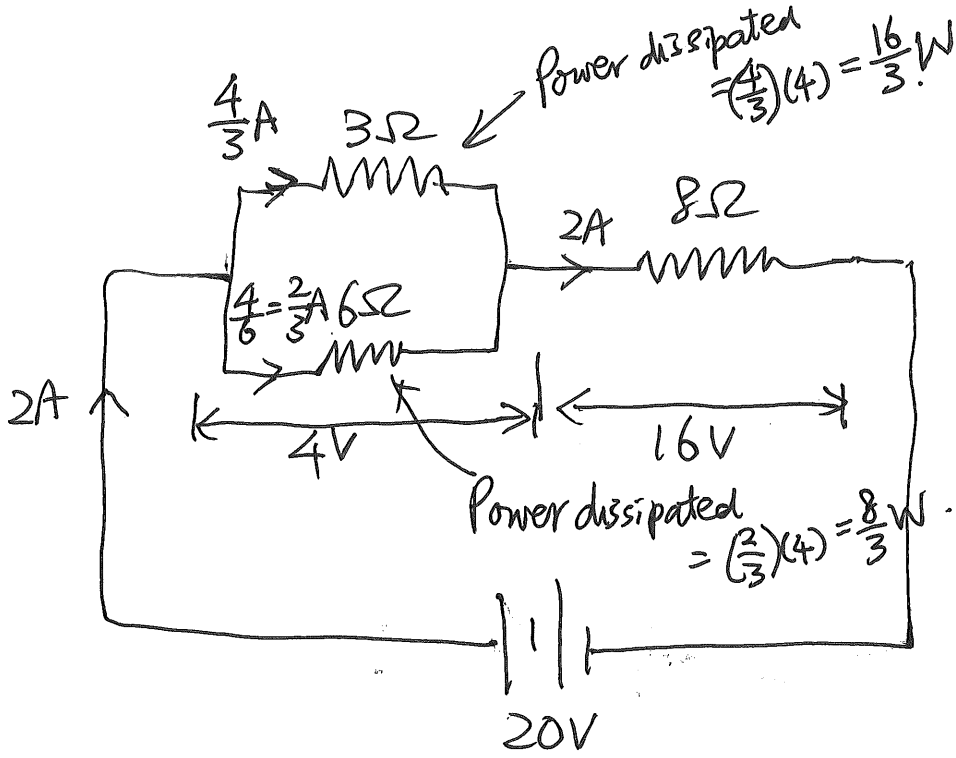
$= (2)^2 (10) = 40W.$

Power dissipated in 8Ω

$= (2)^2 (8).$

$= 32W.$





Total power dissipated $= \frac{16}{3} + \frac{8}{3} + 32$.

$= 8 + 32 = 40W$