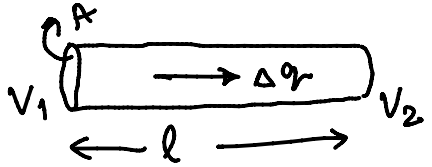
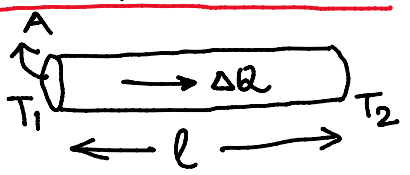
Electrical conduction



Thermal conduction



Electrical Potential (V) $\Longleftrightarrow$ Temperature (T)

Current $(I) = \frac{\Delta q}{\Delta t}$ $\Longleftrightarrow$ rate of heat flow $= \frac{\Delta Q}{\Delta t}$

Ohm's Law

$$\frac{\Delta Q}{\Delta t} = KA\frac{(T_1 - T_2)}{l}$$

$$\frac{\Delta q}{\Delta t} = \frac{V_1 - V_2}{R} \Longleftrightarrow \text{or } \frac{\Delta Q}{\Delta t} = \left(\frac{KA}{l}\right)(T_1 - T_2) \quad -(4)$$

$$= \frac{1}{R}(V_1 - V_2)$$

$$\boxed{R_H = \frac{l}{KA}} \quad -(5)$$

$\rightarrow$ Thermal Resistance of the conductor

For electrical conduction $R = \rho\frac{l}{A}$ $\qquad \rho = \frac{1}{\sigma}$

$$R = \frac{l}{\sigma A}$$