

POWER

$$Power = \frac{Work}{time}, \quad P = \frac{\Delta W}{\Delta t}$$

- **W** may be mechanical work, or work done by a battery driving an electric current.
- In this definition, **Work** can also be replaced with **Heat**. That will be thermal power rather than mechanical or electric one.
- Units of power are Watts [W]: 1W=1J/s (Joule per second)

POWER IN ELECTRIC CIRCUIT

$$Power = Current \times Voltage, \quad P = I \cdot V$$

Homework

Problem 1

Derive expression for Power P consumed by a resistor or a light bulb with resistance R , for two cases : (a) you know the current I flowing through it, (b) you know the voltage V applied to it.

Problem 2

Two light bulbs have power $P = 100\text{W}$ and 50W respectively, when plugged into 110V outlet.

- a) What is the resistance of each light bulb
- b) What will be the power of each bulb if they are connected in series, and plugged into 110V outlet