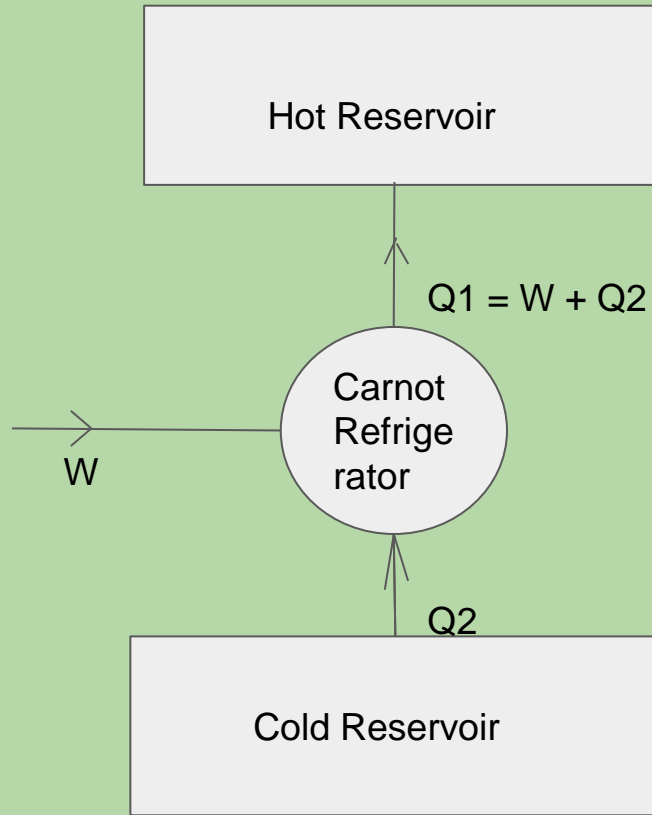


Carnot Engine as a Refrigerator

Dr Mamta
Physics
Shivaji College



Coefficient of performance

Heat extracted at lower temperature from the object to be refrigerated

$\omega =$

Work Output

$$\omega = \frac{Q_2}{W} = \frac{Q_2}{Q_1 - Q_2}$$

Second Law of thermodynamics

The Kelvin-Planck Statement

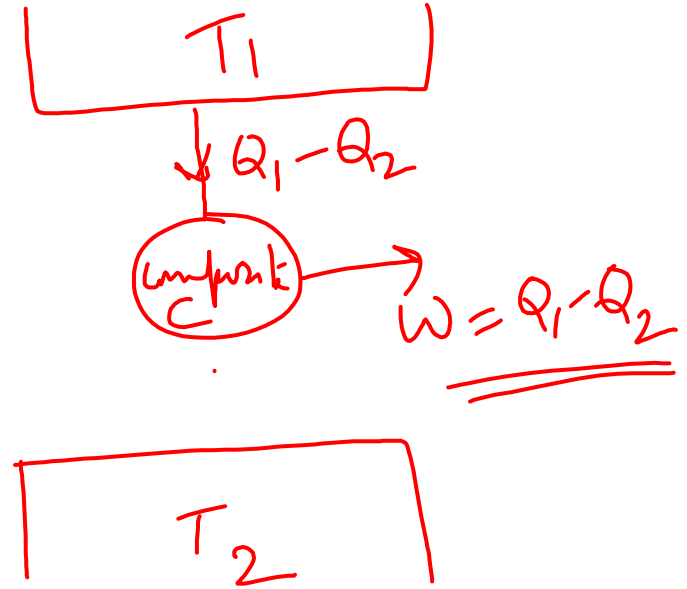
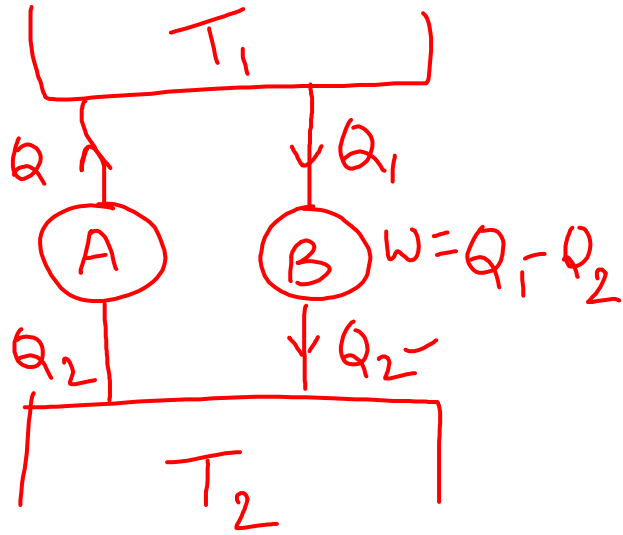
No process is possible whose sole result is complete conversion of heat into work

The Clausius Statement

No process is possible whose sole result is the transfer of heat from a body at a lower temperature to a body at a higher temperature

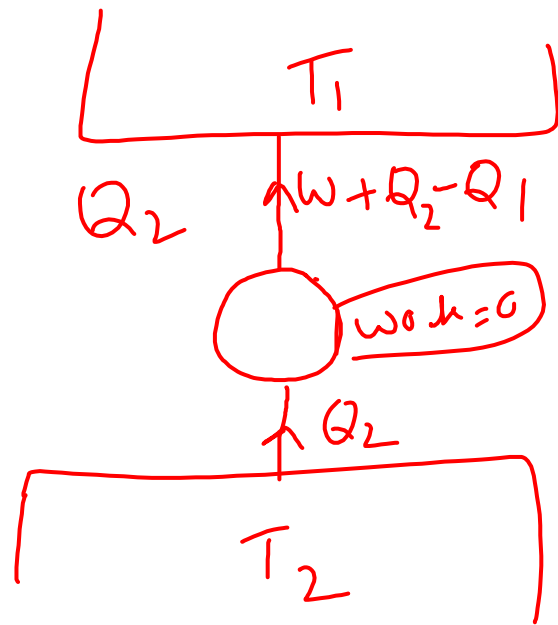
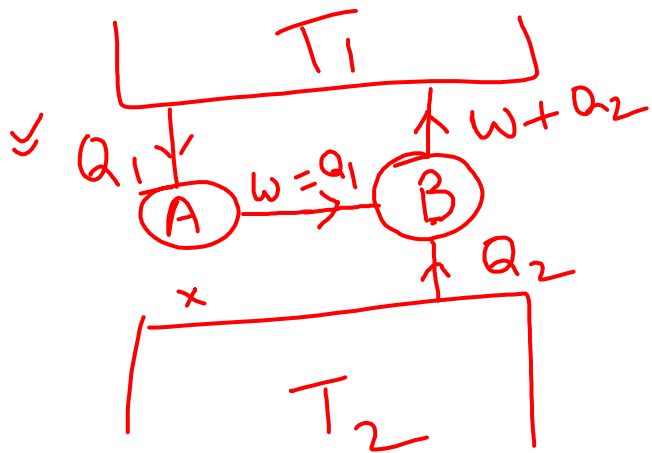
Equivalence of the kelvin- Planck and the Clausius Statements

①



Kelvin TS
violated

②



$$Q_1 + Q_2 - Q_1 = Q_2$$



Thank you