B.4 Thermodynamics (HL)

Checklist (HL)

Higher level (HL)

What you should know

After studying this subtopic, you should be able to:

- Understand that the change in internal energy of a system is related to a change in temperature, and calculate change in internal energy.
- Understand that the work done by or on a closed system can be described in terms of pressure and change of volume.
- Understand and apply the first law of thermodynamics as given by $Q = \Delta U + W$.
- Understand isothermal, isovolumetric, isobaric and adiabatic processes.
- Use the equation $PV^{\frac{5}{3}}$ = constant to model an adiabatic process.
- Understand that entropy is a measure of the amount of disorder of particles in a system, and how it can be determined.
- Understand that the second law of thermodynamics relates to the change in entropy of an isolated system and solve problems involving entropy changes.
- Understand entropy in real isolated systems and non-isolated systems.
- Understand that cyclic gas processes are used in heat engines.
- Understand that different cycles can be used in heat engines and calculate the efficiency of heat engines.
- Understand that the Carnot cycle limits the efficiency of a heat engine.