



ME4523

Thermodynamics 1

Yr 2, Tutorial 1

- (1) Explain the differences between the Celsius, Fahrenheit and Thermodynamic temperature scales. What are the units of the Thermodynamic scale?
- (2) State the First Law of Thermodynamics, and describe each term of the Law.
- (3) Write an expression for the work done by expanding a gas.
- (4) Draw a p - v diagram for a constant pressure heating process. Write down an expression for the work done.
- (5) If a closed system does 5kj of work whilst its internal energy increase by 10kj; how much heat has been transferred and in what direction?
- (6) If a closed system has 20kj of work done on it and 10kj of heat are lost from the system, what is the change in internal energy?
- (7) Complete the following table:

Substance	Quantity	Volume (m ³)	Temperature	Pressure (kPa)
Helium	2 kg	?	90 K	15
Air	? kg	5	23 °C	210
CO ₂	3.1 kg moles	60	°C	400