



**MathsNET**

A joined up approach to  
teaching and learning  
mathematics

# The first law of thermodynamics

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- Write an expression for the change in internal energy,  $\Delta E$ , that occurs when a system outputs  $\Delta q$  worth of heat and does  $\Delta w$  worth of work.
- Write integrals for the changes in internal energy that occur during (i) an adiabatic transition and (ii) an isochoric transition.
- Give expressions that relate the pressure and temperature to partial derivatives of the internal energy.
- State the first law of thermodynamics