**70** An ideal gas, at initial temperature *T*1 and initial volume 2.0 m3, is expanded adiabatically to a volume of 4.0 m3, then expanded isothermally to a volume of 10 m3, and then compressed adiabatically back to *T*1.What is its final volume?

For adiabatic processes

Adiabatic

P

2 4 6 8 10

3

2

`

1 T1

4 T1

Isothermal

For isothermal processes

V(m3)

Dividing eqn (1) by eqn (3) and eqn (2) by eqn (4) we get:

Multiplying the last two eqns we get