



- 3 A fixed mass of an ideal gas undergoes the cycle ABCA of changes shown in Fig. 3.1.

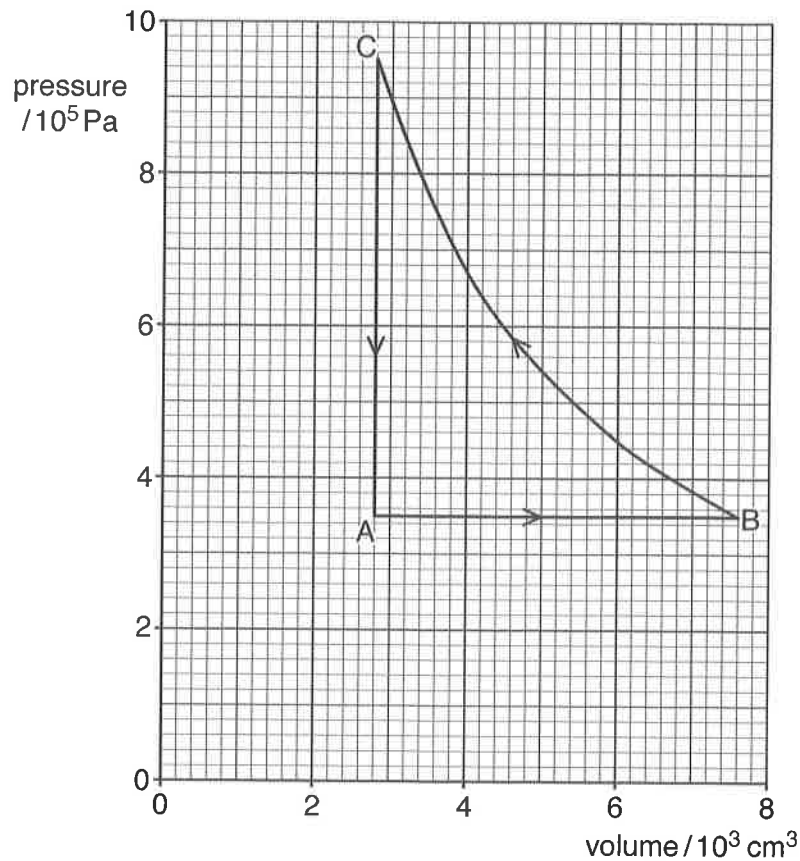


Fig. 3.1

The gas at point A has volume $2.8 \times 10^3 \text{ cm}^3$, pressure $3.5 \times 10^5 \text{ Pa}$ and temperature 315 K. The gas is then heated at constant pressure so that, at point B, its volume is $7.6 \times 10^3 \text{ cm}^3$.

- (a) For the gas at point B, calculate
- (i) its temperature,

temperature = K [2]



(ii) the external work done by the gas to expand from point A to point B.

work done = J [2]

- (b) The temperature of the gas remains constant from point B to point C so that, at point C, its volume is $2.8 \times 10^3 \text{ cm}^3$.

The gas now returns from point C to point A. During this change, the gas loses 2520 J of thermal energy to the surroundings.

Complete Fig. 3.2 to show the increases in internal energy at each stage of the cycle ABCA.

stage	increase in internal energy / J
from point B to point C
from point C to point A
from point A to point B

Fig. 3.2

[3]

[Total: 7]

