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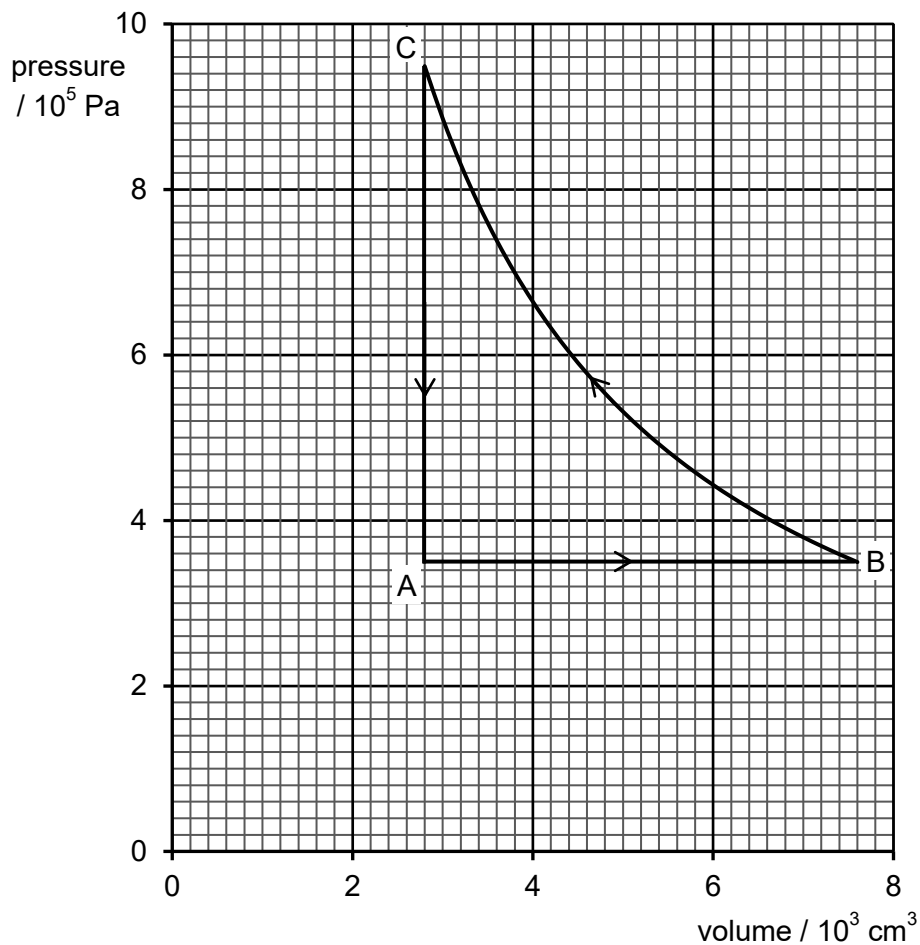

Fig. 3.1

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

(a) For the gas at point B, calculate

    (i) its temperature,

temperature = ... K [2]

[Turn over

(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 2.8×10^3 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]