

- (a) Fig. 4.1 shows some gas contained in a cylinder by a heavy piston. The piston can move up and down in the cylinder with negligible friction.

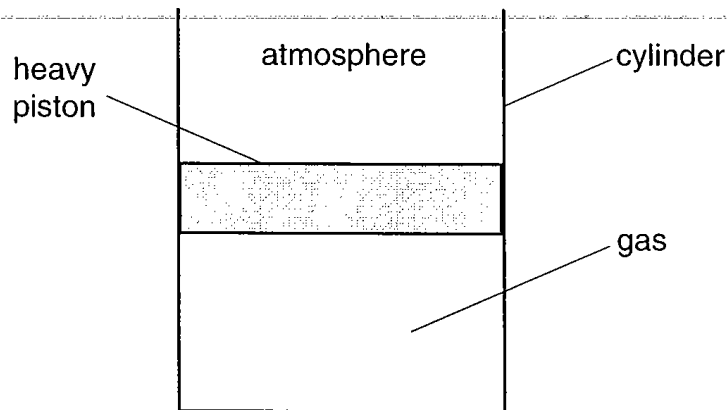


Fig. 4.1

There is a small increase in the pressure of the atmosphere above the piston.

- (i) On Fig. 4.1, draw a possible new position for the lower face of the piston. [1]
- (ii) Explain, in terms of the molecules of the gas and the molecules of the atmosphere, your answer to (a)(i).

*air molecules collide with piston walls. There is greater force pressure on top than bottom initially. The number of collisions of gas molecules with piston increases and the piston moves until pressures become equal*

- (b) The pressure of the atmosphere above the piston returns to its original value, and the piston returns to its original position, as shown in Fig. 4.2.

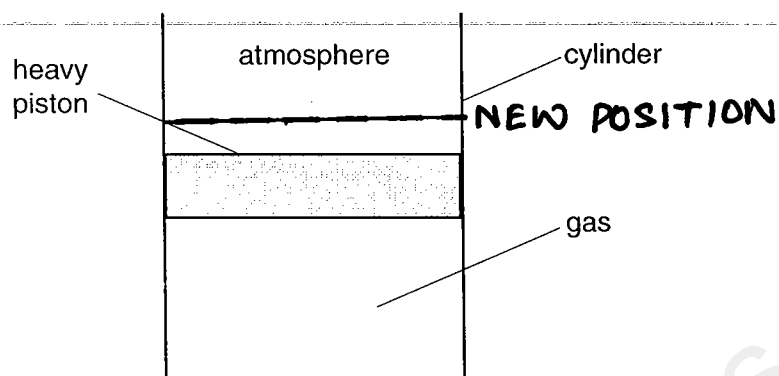


Fig. 4.2

The gas, piston and cylinder are now heated to a much higher temperature.

- (i) On Fig. 4.2, draw a possible new position for the lower face of the piston. [1]
- (ii) Explain, in terms of the molecules of the gas and the molecules of the atmosphere, your answer to (b)(i).

*molecules of gas move faster with more momentum. They have more KE. So the collisions are harder. There is greater pressure on bottom than top initially. The piston moves up until the pressures equal.*