7 A student uses a syringe containing trapped air to investigate pressure.

Diagram 1 shows the apparatus he uses.

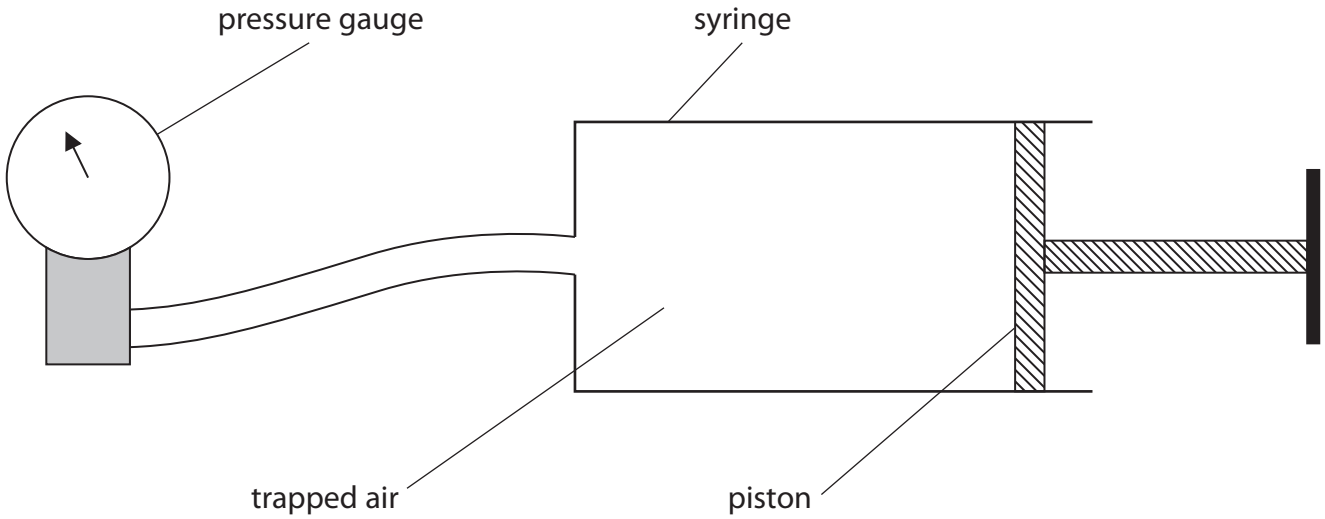

Diagram 1

(a) Diagram 2 shows the pressure gauge when the piston is at its initial position.

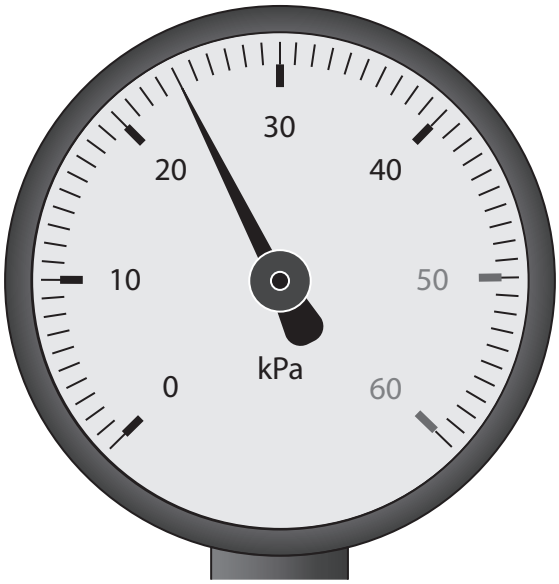

Diagram 2

Determine the reading on the pressure gauge.

(1)

pressure = ... kPa

(b) The piston is pushed in so that the volume of trapped air in the syringe is halved. The temperature of the trapped air remains constant.

Explain how the reading on the pressure gauge will change when the piston is pushed in.

(3)

(c) The position of the piston is then fixed so that the volume of trapped air in the syringe is now constant.

The air in the syringe is then cooled.

(i) State how the motion of air particles inside the syringe changes when the air is cooled.

(1)

(ii) Explain how the pressure of the trapped air inside the syringe changes when the air is cooled.

Refer to particles in your answer.

(3)

(Total for Question 7 = 8 marks)