9 (a) Diagram 1 shows a plastic bottle containing water.

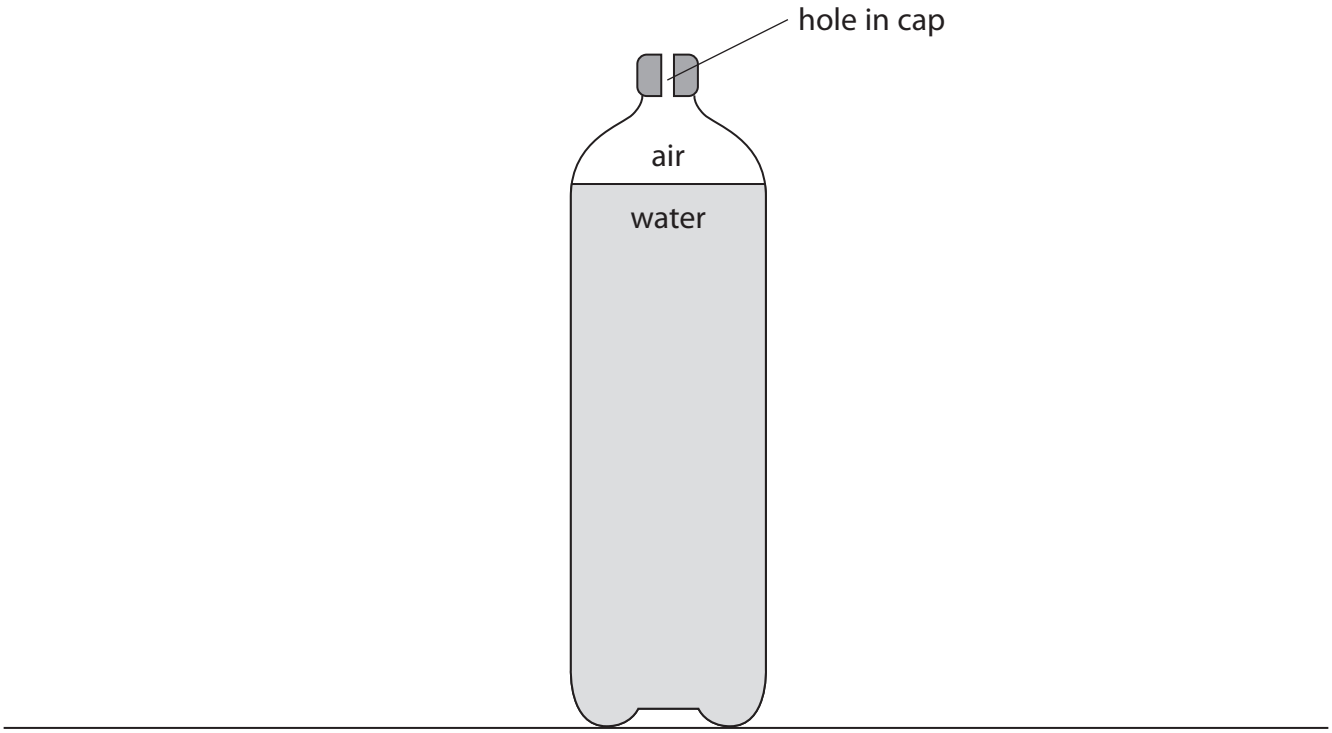

Diagram 1

(i) State the formula linking pressure difference, height, density and gravitational field strength, *g*.

(1)

(ii) The pressure difference between the surface of the water and the water at the bottom of the bottle is 2300 Pa.

Calculate the depth of water in the bottle.

Give your answer in cm.
[density of water = 1000 kg / m^3]

(3)

depth = ... cm

(b) Three holes are made in the bottle at positions A, B and C.

Diagram 2 shows the path of the water leaving the bottle from hole B.

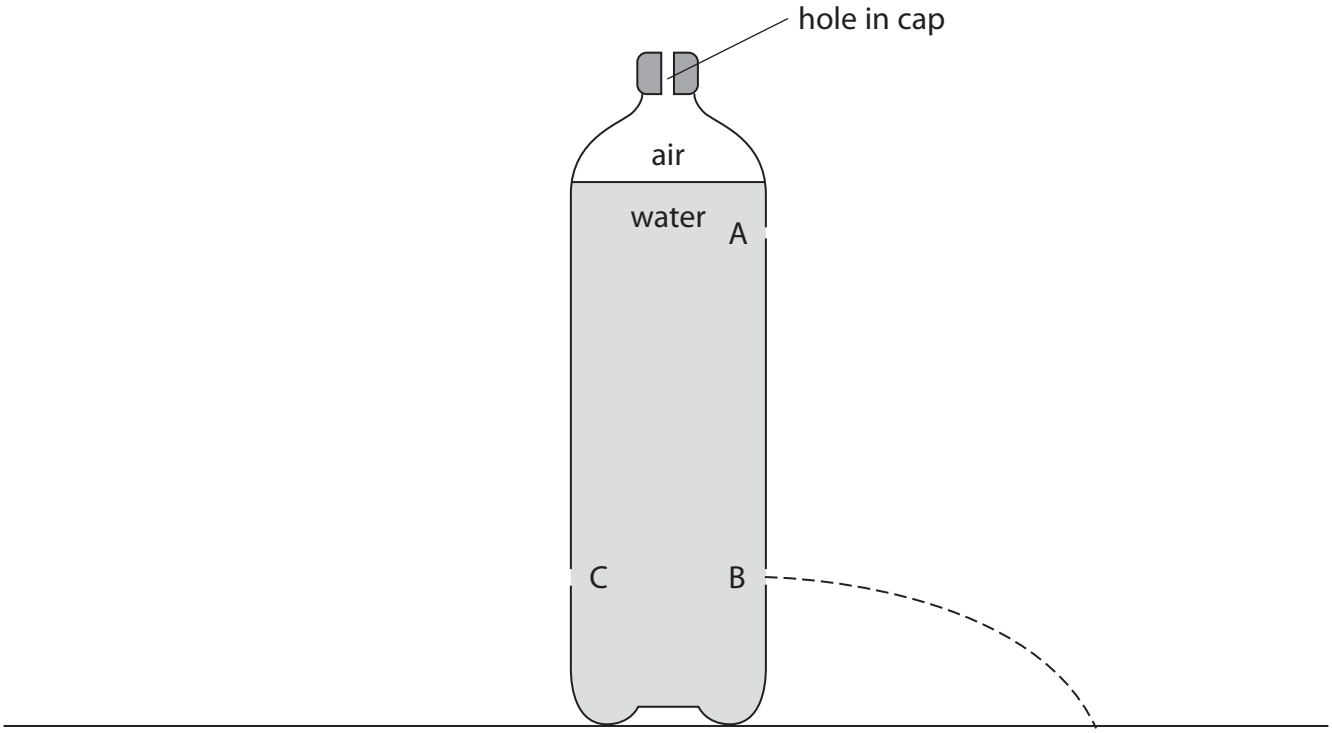

Diagram 2

(i) Draw a line on diagram 2 to show the path of the water leaving the bottle from hole A.

(1)

(ii) Explain the path of the water leaving the bottle from hole A.

(2)

(iii) Hole C is at the same depth in the bottle as hole B but on the opposite side of the bottle.

Explain the shape of the path of the water leaving the bottle from hole C.

(3)

(iv) Suggest why there is a hole in the cap of the bottle.

(1)

(Total for Question 9 = 11 marks)