2 **(a)** Fig. 2.1 shows a liquid in a cylindrical container.

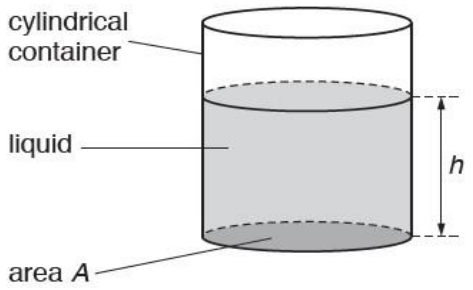

Fig. 2.1

The cross-sectional area of the container is A. the height of the column of liquid is h and the density of the liquid is ρ.

Show that the pressure p due to the liquid at the base of the cylinder is given by

$$p = h\rho g$$

[2]

(b) The variation with height h of the total pressure P on the base of the cylinder is shown in Fig. 2.2.

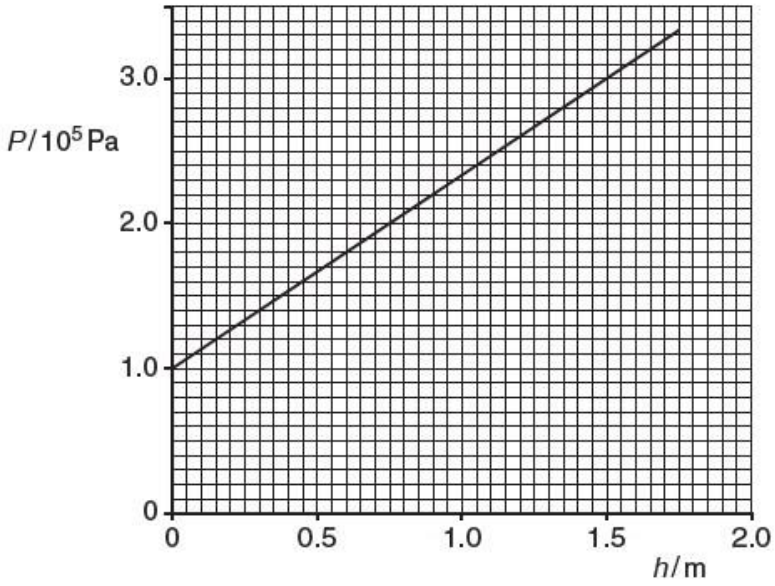

Fig. 2.2

(i) Explain why the line of the graph in Fig. 2.2 does not pass through the origin (0,0).

……

…… [1]

(ii) Use data from Fig. 2.2 to calculate the density of the liquid in the cylinder.

density = …… kg m^{-3} [3]

(c) An object is dropped into the liquid and it floats. Explain why the density of the object is lower than that of the liquid.

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…… [2]

[Total: 8]