Pressure – 2022 Nov O Level 5054

1. Nov/2022/Paper_11/No.13

Each tyre of a car has an area of 100 cm^2 in contact with the ground.

The car has a mass of 1600 kg. The weight of the car is equally distributed amongst the four tyres.

The gravitational field strength g is 10 N/kg.

What is the pressure exerted on the ground?

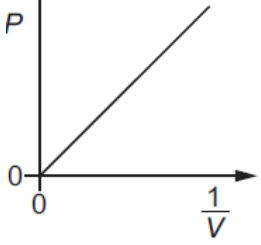
A 4.0 N/cm^2 **B** 16 N/cm^2 **C** 40 N/cm^2 **D** 160 N/cm^2

2. Nov/2022/Paper_11/No.14

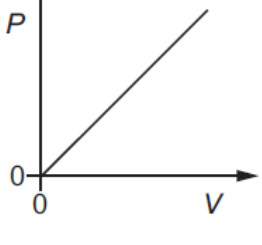
The pressure P of some trapped air is varied. The mass and the temperature of the trapped air remain constant.

Which graph shows how the volume V of the air varies with the pressure P?

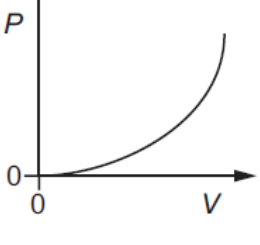
A



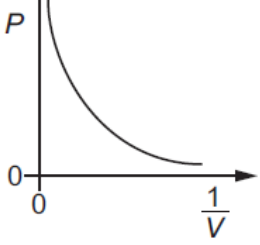
B



C



D



3. Nov/2022/Paper_21/No.3

A curved, glass tube is open at one end and sealed at the other.

A dense liquid is poured into the tube. The liquid traps air in the sealed end.

Fig. 3.1 shows the tube, the liquid and the trapped air.

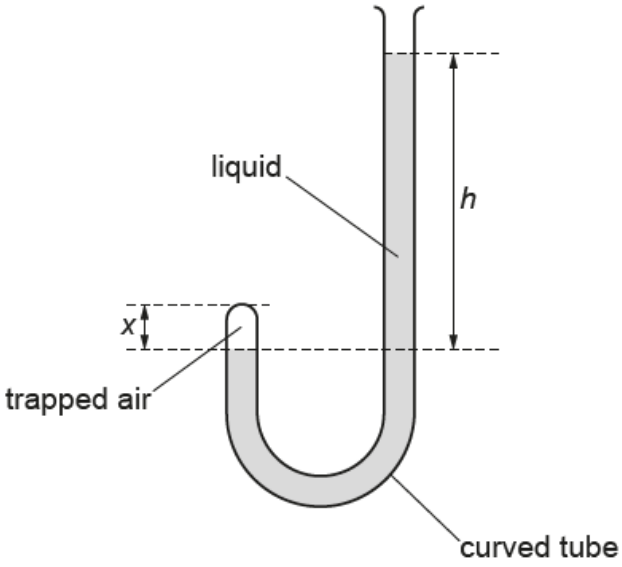


Fig. 3.1

(a) The difference between the liquid levels is h. At room temperature, h is 0.57 m.

The density of the liquid is 1.4×10^4 kg/m^3.

The gravitational field strength g is 10 N/kg and the atmospheric pressure is 1.0×10^5 Pa.

Calculate the pressure of the trapped air.

pressure = ... [3]

(b) The trapped air in the tube is heated.

(i) The height of the trapped air in the tube is x.

Explain, in terms of molecules, why x changes when the air is heated.

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..... [3]

(ii) The trapped air reaches a constant temperature that is greater than its initial temperature.

Describe and explain the change in h in terms of the pressures involved.

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..... [2]

[Total: 8]