9 Diagram 1 shows a conical flask containing water.

Diagram 2 shows a beaker with the same base area as the flask and containing water of the same depth *d*.

diagram 1

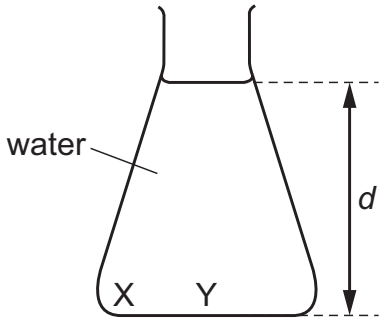
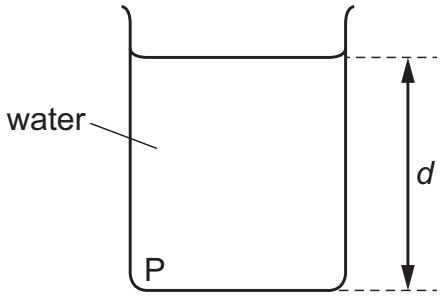


diagram 2



Which statement is correct?

A The pressure at P is equal to the pressure at X.

B The pressure at P is greater than the pressure at Y.

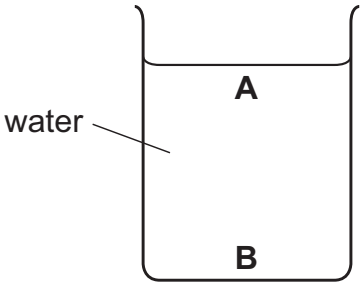
C The pressure at P is greater than the pressure at X.

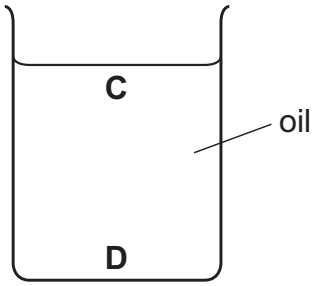
D The pressure at Y is greater than the pressure at X.

9 Two beakers are filled to the same depth, one with water and one with oil.

The density of water is 1000 kg / m^3. The density of oil is 920 kg / m^3.

In which position is the pressure the greatest?





4 Fig. 4.1 shows gas trapped in a cylinder by a piston.

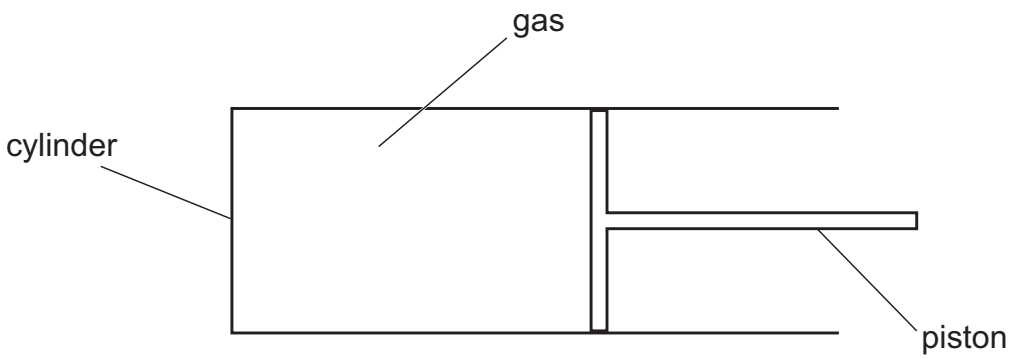


Fig. 4.1

(a) The volume of gas is 240 cm^3.
The piston is pushed to the left and is held in its new position.

(i) The pressure of the gas increases from 1.0×10^5 Pa to 1.4×10^5 Pa.

The temperature of the gas remains constant.

Calculate the volume of the gas when the piston is in its new position.

volume = ... cm^3 [3]

(ii) The area of the piston in contact with the gas is 1.9×10^{-3} m^2.

Calculate the force exerted on the piston by the gas when the piston is held in its new position.

force = ... [2]

(iii) The distance moved by the piston is 0.036 m. The average force exerted by the piston as it moves is 220 N.

Calculate the mechanical work done by the piston. State the equation you use.

work done = ... [2]

(b) Explain, in terms of particles, why gases can be compressed but liquids cannot.

.....

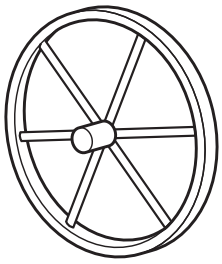
.....

..... [1]

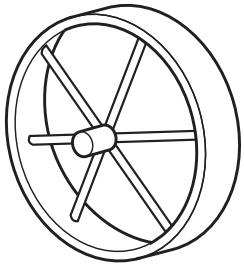
[Total: 8]

9 A farmer has two carts. The carts have the same weight, but one has four narrow wheels and the other has four wide wheels.

narrow wheel



wide wheel



Which cart wheels sink less into soft ground and what is the reason?

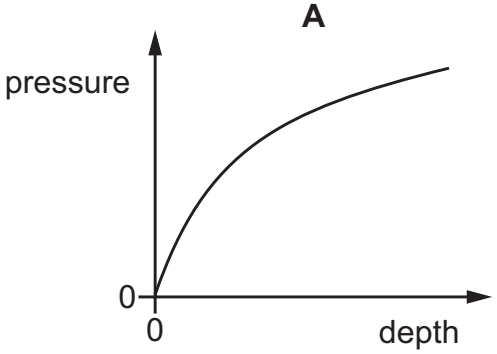
	cart wheels	reason
A	narrow	greater pressure on the ground
B	narrow	less pressure on the ground
C	wide	greater pressure on the ground
D	wide	less pressure on the ground

11 The water in a swimming pool exerts a pressure at the bottom of the pool.

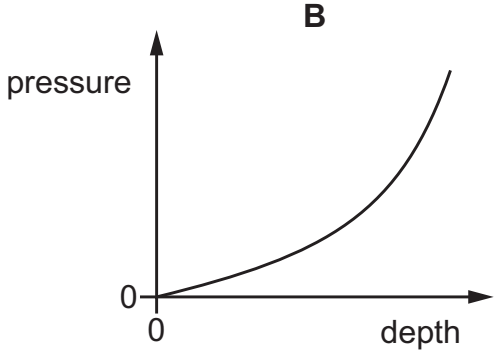
Which graph shows the relationship between the pressure exerted by the water and the depth of water in the pool?

(Assume the density of water is constant.)

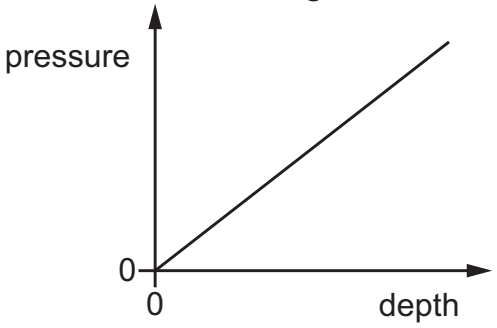
A



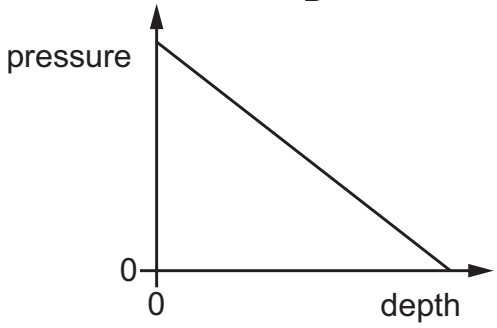
B



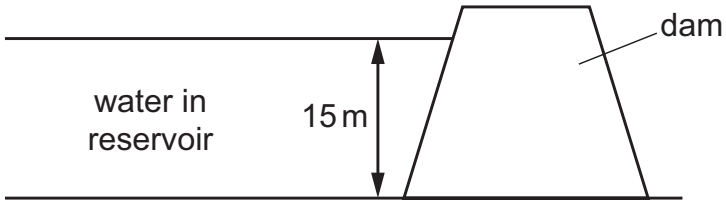
C



D



13 A dam holds water in a reservoir. The height of the water in the reservoir is 15 m.



The density of water is 1000 kg / m^3.

What is the pressure due to the water at the bottom of the dam?

A 6.8 Pa **B** 1500 Pa **C** 15 000 Pa **D** 150 000 Pa