

Past-paper walk-through

Pressure ■ 1.8

eXercise

Questions in this set

- 0625/21 N25 Q9 ■ 1 mark
- 0625/22 N25 Q9 ■ 1 mark
- 0625/42 N25 Q4 ■ 8 marks
- 0625/21 J25 Q9 ■ 1 mark
- 0625/21 N23 Q11 ■ 1 mark
- 0625/21 J23 Q13 ■ 1 mark

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 9

0625/21 N25 ■ Q9 ■ 1 mark

- 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

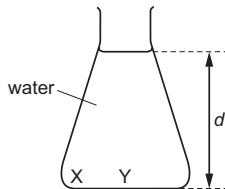
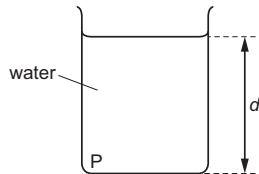


diagram 2



Which statement is correct?

Question 9

- 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.

Solution 9

Answer: **A**

Why

- Pressure in a liquid depends only on depth, density and g – not on the shape of the container.
- Both contain the same liquid to the same depth d .
- So the pressure at the base is the same in each, even though the flask holds less water.

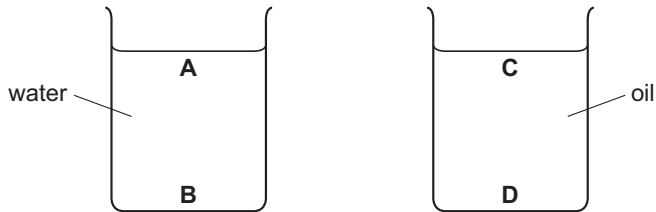
Question 9

0625/22 N25 ■ Q9 ■ 1 mark

- 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?



Question 9

Solution 9

Answer: **B**

Why

- Pressure in a liquid is ρgh , so it rises with both depth and density.
- Both beakers are filled to the same depth, so the densities decide it.
- Water is denser than oil, so the greatest pressure is at the *bottom* of the water.

Question 4

0625/42 N25 ■ Q4 ■ 8 marks

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

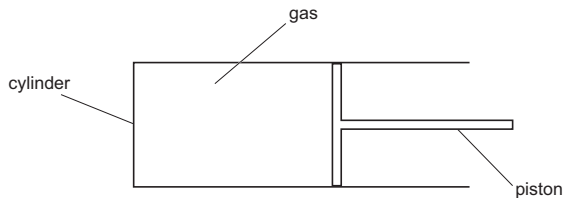


Fig. 4.1

- (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 $1.0 \times 10^5\text{ Pa}$ to $1.4 \times 10^5\text{ Pa}$.

Question 4

- (v) The pressure of the gas increases from $1.0 \times 10^5 \text{ Pa}$ to $1.4 \times 10^5 \text{ Pa}$.

The temperature of the gas remains constant.

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

Question 4

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

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

Question 4

- (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.

Question 4

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

Question 4

[Total: 8]

Solution 4

(a)(i)

Mark scheme

- 170 (cm³)
- $pV = \text{constant}$ OR $1.0 \times 10^5 \times 240 = 1.4 \times 10^5 \times V_2$
- $(V_2 =) \{1.0 \times 10^5 \times 240\} / 1.4 \times 10^5$ OR 1.7×10^5

Solution 4

(a)(ii)

Mark scheme

- 270 N
- $(F =) \text{ pA OR } (F =) 1.4 \times 10^5 \times 1.9 \times 10^{-3}$

(a)(iii)

Mark scheme

- $(W =) Fd$ in words or symbols
- 7.9 J

Solution 4

(b)

Mark scheme

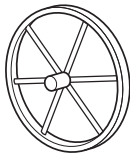
- distance between gas particles is much larger (than distance between liquid particles)
- OR particles in liquid are touching AND particles in gas are far apart
- 0625/42
- October/November 2025

Question 9

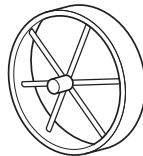
0625/21 J25 ■ Q9 ■ 1 mark

- 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

Question 9

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

Solution 9

Answer: **D**

Why

- The two carts weigh the same, so the *force* pressing on the ground is the same.
- Pressure is force divided by area, so a larger contact area gives a lower pressure.
- Wide wheels therefore exert less pressure and sink in less.

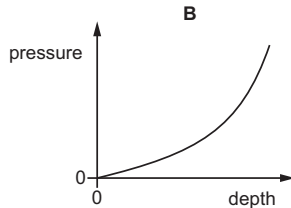
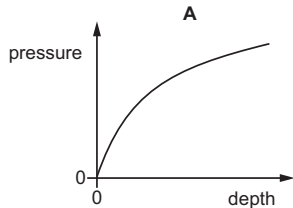
Question 11

0625/21 N23 ■ Q11 ■ 1 mark

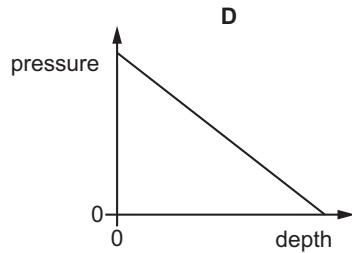
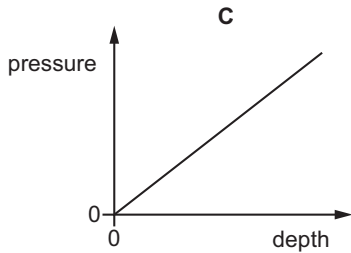
- 11** The water in a swimming pool exerts a pressure at the bottom of the pool.

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.)



Question 11



Solution 11

Answer: **C**

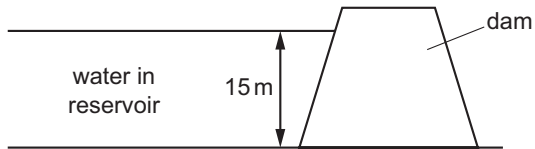
Why

- Pressure in a liquid is $p = \rho gh$, so it is *proportional* to the depth.
- A proportional relationship plots as a straight line.
- That line must also pass through the origin, since at zero depth the liquid exerts no pressure.

Question 13

0625/21 J23 ■ Q13 ■ 1 mark

- 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

Solution 13

Answer: **D**

Why

- Pressure due to a liquid column is $p = \rho gh$.
- Here $\rho = 1000 \text{ kg/m}^3$ and $h = 15 \text{ m}$.
- $p = 1000 \times 10 \times 15 = 150\,000 \text{ Pa}$.