

Pressure in Fluids

Physics only

Instructions: Fill in both formulas, then use the keywords in your explanations. Give every answer a unit.

Pressure Due to a Force Normal to a Surface

THE FORMULA IN WORDS

... AND IN SYMBOLS

$$p \text{ in Pa (N/m}^2\text{)} \cdot F \text{ in N} \cdot A \text{ in m}^2$$

MAKE UP YOUR OWN CALCULATION

Pressure Due to a Column of Liquid Above

THE FORMULA IN WORDS

... AND IN SYMBOLS

$$p \text{ in Pa} \cdot h \text{ in m} \cdot \rho \text{ in kg/m}^3 \cdot g \text{ in N/kg}$$

MAKE UP YOUR OWN CALCULATION

Explaining Pressure in a Fluid

use every keyword at least once

constant density gravitational field strength height fluid above weight pressure

(a) Explain why the pressure at the bottom of a swimming pool is greater than the pressure just below the surface. [3]

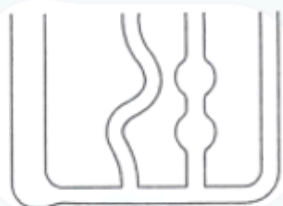
(b) The density of air is **not** constant. Explain why atmospheric pressure is greatest at the Earth's surface, and why $p = h\rho g$ cannot be used for the whole atmosphere. [3]

Exam-Style Question — Pressure in a Fluid

[5 marks]

DIAGRAMS — COMPLETE EACH ONE, THEN TICK THE STATEMENT IT SHOWS

1



liquid level

Draw the liquid level in every tube.

☐ A ☐ B ☐ C ☐ D

2

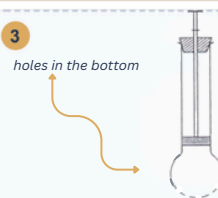


pressure at a depth

Draw the water jet from each hole.

☐ A ☐ B ☐ C ☐ D

3



equal pressure

Draw arrows to show which way the water goes.

☐ A ☐ B ☐ C ☐ D

- A Pressure is **directly proportional to the height** of fluid above.
- B Pressure is the **same at the same height** in a fluid, whatever the shape of the container.
- C Pressure in a fluid acts **equally in all directions**.
- D Pressure depends on the **width** of the container.

PROSE

(a) Explain why the liquid reaches the same level in every tube in diagram 1. [2]

CALCULATION

(b) The tank in diagram 2 is filled with water to a depth of 1.2 m. Density of water = 1000 kg/m³, g = 9.8 N/kg. Calculate the pressure at the bottom. [3]
