

Density, pressure and pressure in liquids

Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test covers density, pressure and pressure in liquids. Write the equation, show the substitution and include units. Use $g = 9.8 \text{ N/kg}$ and a density of water of 1000 kg/m^3 . Calculators are allowed. The total is 20 marks.

Level: Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE P3, IGCSE 1.8

Time: 40 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Density equation (1 mark)

Write the equation that links density, mass and volume. (1 mark)

Question 2 Pressure equation (1 mark)

Write the equation that links pressure, force and area. (1 mark)

Question 3 Density of a block (3 marks)

A metal block measures $0.050 \text{ m} \times 0.040 \text{ m} \times 0.10 \text{ m}$ and has a mass of 1.56 kg .

- Calculate the volume of the block in m^3 . (1 mark)
- Calculate the density of the block. (2 marks)

Question 4 Float or sink (3 marks)

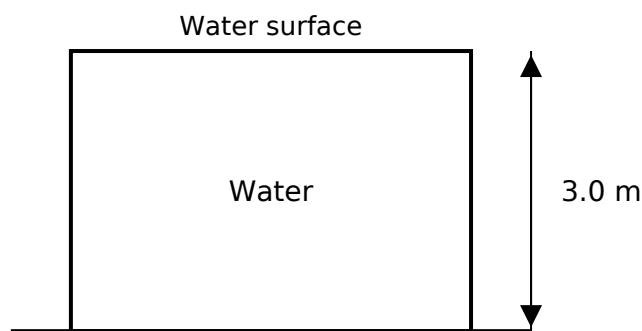
An object has a density of 850 kg/m^3 . Water has a density of 1000 kg/m^3 .

- State whether it floats or sinks in water and give a reason. (2 marks)
- State whether it floats or sinks in a liquid of density 800 kg/m^3 . (1 mark)

Question 5 Pressure under a foot (3 marks)

A girl exerts a force of 640 N on the ground through two shoes with a total area of 0.016 m^2 .

- Calculate the pressure on the ground. (2 marks)
- Explain why wearing snowshoes of larger area stops her sinking in snow. (1 mark)

Question 6 Pressure in a tank (4 marks)

A tank of water.

Use the figure. Water has a density of 1000 kg/m^3 and $g = 9.8 \text{ N/kg}$.

- Calculate the pressure due to the water at the base of the tank. (2 marks)
- State the pressure due to the water at a depth of 6.0 m. (1 mark)
- Explain why the base of a dam wall is thicker than the top. (1 mark)

Question 7 Volume by displacement (3 marks)

Describe how you would find the density of a small irregular stone using a balance and a measuring cylinder with water. (3 marks)

Question 8 Drawing pin (2 marks)

Explain why a drawing pin is easy to push into a wall by pressing on the head. (2 marks)