

GCSE Physics B (Twenty First Century Science)
J259/03 Depth in physics (Higher Tier)

Question Set 26

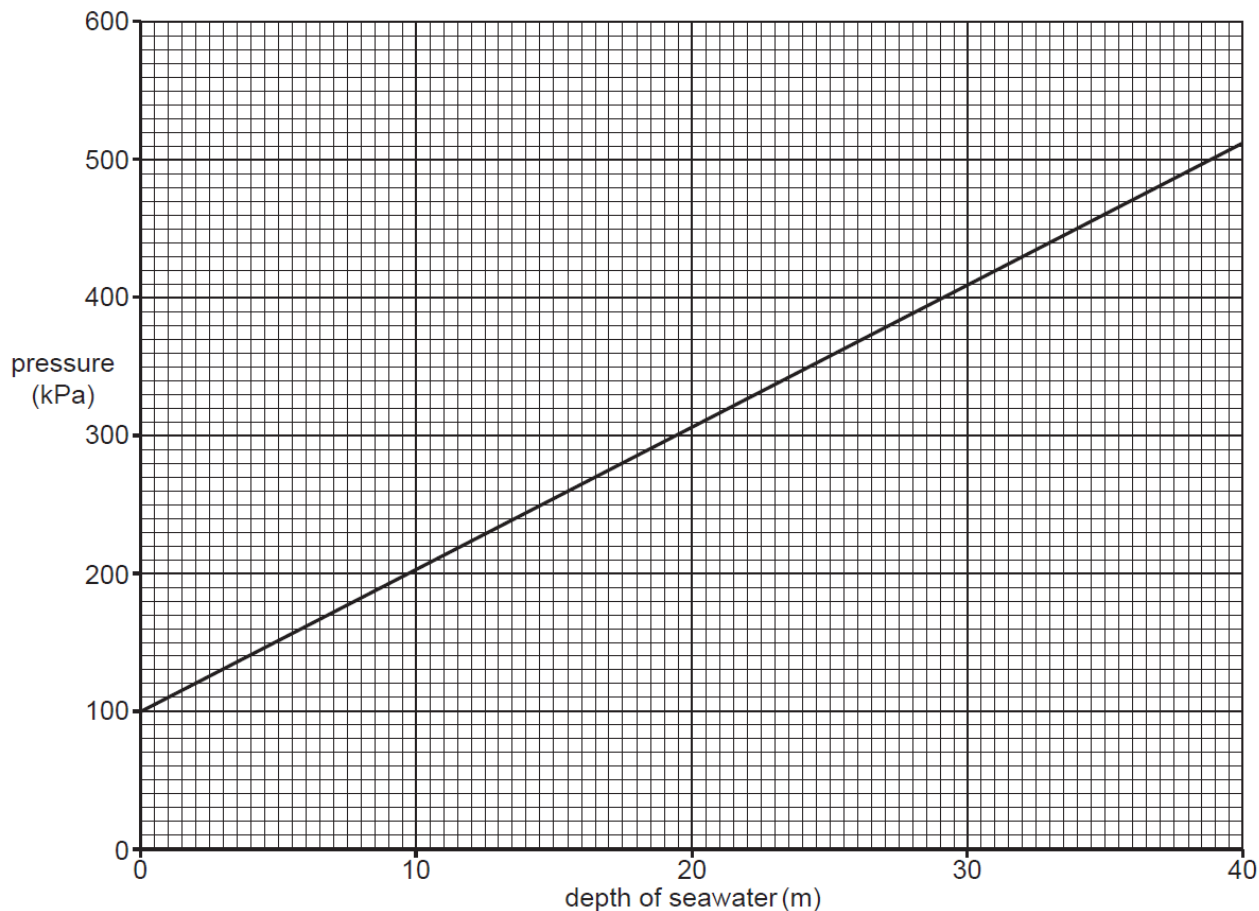
1 Alex is a deep-sea diver.

As he swims downwards into the ocean, the pressure changes.

(a) Explain why the pressure changes with increasing depth in the ocean.

[2]

(b) The graph shows how pressure changes with depth of seawater.



(i) Determine the intercept of the graph.

Intercept = kPa [1]

(ii) Explain the physical meaning of the value of the intercept.

[2]

(c) (i) Determine the gradient of the graph.

Gradient = kPa/m [2]

(ii) Calculate the density of seawater.

Use the equation: density = gradient of graph \div gravitational field strength

Gravitational field strength = 10 N/kg

Density = kg/m³ [2]

Resource Materials

Equations in Physics

change in internal energy = mass \times specific heat capacity \times change in temperature

energy to cause a change in state = mass \times specific latent heat

for gases: pressure \times volume = constant
(for a given mass of gas and at a constant temperature)

(final speed)² – (initial speed)² = 2 \times acceleration \times distance

energy stored in a stretched spring = $\frac{1}{2}$ \times spring constant \times (extension)²

potential difference across primary coil \times current in primary coil =
potential difference across secondary coil \times current in secondary coil

Higher tier only –

pressure due to a column of liquid = height of column \times density of liquid \times g

force = magnetic flux density \times current \times length of conductor

**potential difference across primary coil \div potential difference across secondary coil =
number of turns in primary coil \div number of turns in secondary coil**

change in momentum = resultant force \times time for which it acts

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