

Pressure and pressure difference in fluids – GCSE Physics Paper 2

1. No.7

0	7
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A swimming pool is being filled with water.

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Calculate the weight of the water in the swimming pool when the mass of the water is 25 000 kg.

gravitational field strength = 9.8 N/kg

Use the equation:

$$\text{weight} = \text{mass} \times \text{gravitational field strength}$$

[2 marks]

Weight = _____ N

07.2

When the swimming pool is full, the weight of the water is 1 960 000 N.

The bottom of the swimming pool has an area of 49 m².

Calculate the pressure at the bottom of the swimming pool when it is full.

Use the equation:

$$\text{pressure} = \frac{\text{weight}}{\text{area}}$$

Choose the unit from the box.

[3 marks]

m²

m³

N

Pa

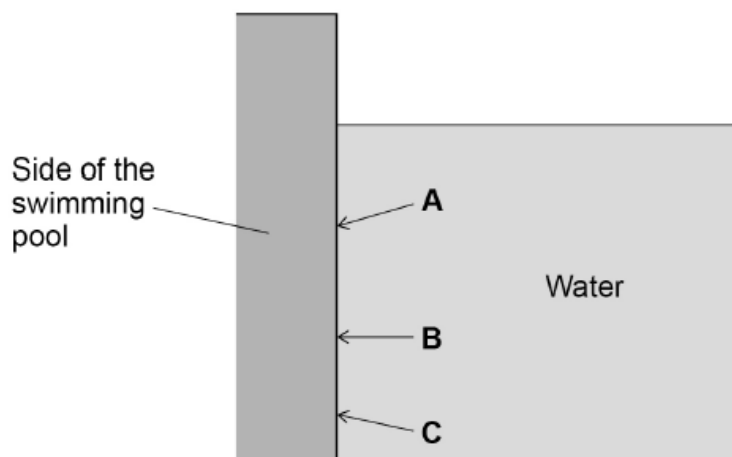
Pressure = _____ Unit _____

07.3

There is a force acting on the side of the swimming pool because of the water pressure.

Figure 11 shows the side of the swimming pool.

Figure 11



Which arrow shows the direction of the force acting on the side of the swimming pool? [1 mark]

Tick (✓) **one** box.

A ☐

B ☐

C ☐

07.4

A child is swimming in the pool. The velocity of the child is 0.70 m/s.

The child then accelerates for 5.0 s, reaching a final velocity of 1.3 m/s.

Calculate the acceleration of the child.

Use the equation:

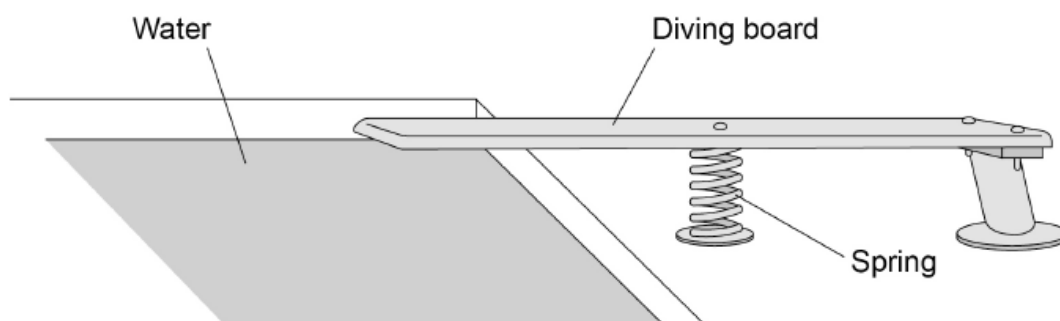
$$\text{acceleration} = \frac{\text{change in velocity}}{\text{time taken}}$$

[2 marks]

Acceleration = _____ m/s²

Figure 12 shows a diving board at the side of the swimming pool.

Figure 12



0 7 . 5 The original length of the spring is 0.84 m.

When the child stands on the diving board, the length of the spring decreases by 0.21 m.

Calculate the percentage change in the length of the spring.

[2 marks]

Percentage change in length = _____ %

Use the Physics Equations Sheet to answer questions 07.6 and 07.7.

07.6

Write down the equation which links extension (e), force applied to a spring (F) and spring constant (k).

[1 mark]

07.7

The force applied to the spring by the weight of the child is 336 N.

The change in length of the spring is 0.21 m.

Calculate the spring constant of the spring.

[3 marks]

Spring constant = _____ N/m

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The child steps off the diving board and falls into the swimming pool.

The initial velocity of the child is 0 m/s.

acceleration due to gravity = 9.8 m/s^2

Calculate the final velocity when the child has fallen a distance of 0.95 m through the air.

Give your answer to 2 significant figures.

Use the Physics Equations Sheet.

[4 marks]

Final velocity of child (2 significant figures) = _____ m/s