PRESSURE-SET-4

1 A man is in contact with the floor.

In which of these situations does he produce the least pressure on the floor?

A kneeling

B lying flat on his back

C standing on both feet

D standing on one foot

2 The water in a lake is at 5 °C. A diver measures the pressure of the water at two different depths in the lake. He repeats the measurements on a different day when the water is at 15 °C.
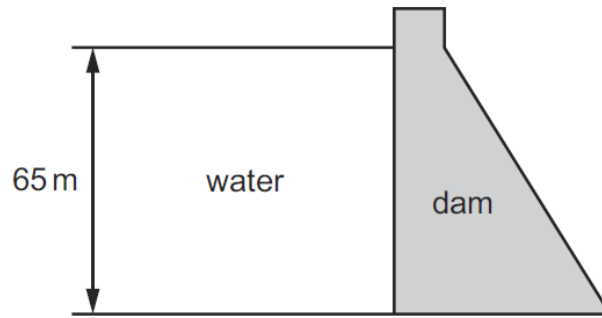
The density of the water decreases when its temperature increases.

Which combination of depth and temperature produces the greatest water pressure?

	depth/m	temperature/°C
A	10	5
B	10	15
C	20	5
D	20	15

3	The diagram shows a dam holding back water.

The depth of the water is 65 m.

The density of the water is 1000 kg/m³. The gravitational field strength g is 10 N/kg.

What is the pressure exerted at the base of the dam due to the water?

A 15.4 Pa **B** 154 Pa **C** 65 000 Pa **D** 650 000 Pa

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4 The equation used to find the pressure caused by a liquid can be written as
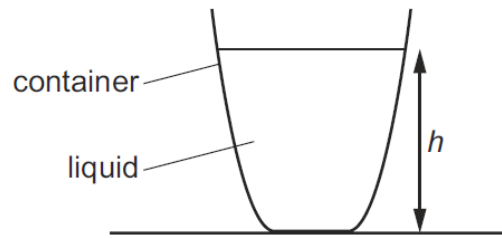
$$p = h \times Y \times Z$$

where p is the pressure and h is the depth of the liquid.

Which row gives the quantities Y and Z?

	Y	Z
A	cross-sectional area	gravitational field strength
B	cross-sectional area	volume
C	density	cross-sectional area
D	density	gravitational field strength

| 5	A container is filled with liquid to a certain depth h.

The pressure of the liquid at the bottom of the container depends on several factors.

Which is one factor on which the pressure does **not** depend?

A   the strength of the Earth's gravitational field

B   the density of the liquid

C   the depth of the liquid

D   the strength of the Earth's magnetic field

6	The diagram shows an air-filled rubber toy. A child sits on the toy and its volume decreases.

The temperature of the air in the toy does not change.
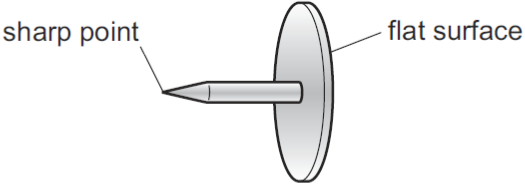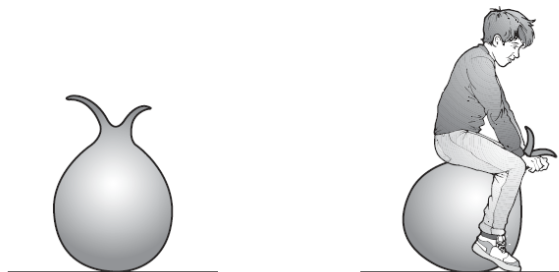

How does the air pressure in the toy change and why?

	pressure	reason
A	decreases	air molecules move more slowly
B	decreases	air molecules strike the rubber less frequently
C	increases	air molecules move more quickly
D	increases	air molecules strike the rubber more frequently

7	A bubble of air has a volume of $2.0\,\text{cm}^3$ at the bottom of a lake where the total pressure is $4.0 \times 10^5\,\text{Pa}$. The temperature of the water in the lake is constant. The atmospheric pressure at the surface is $1.0 \times 10^5\,\text{Pa}$.
	What is the volume of the bubble when it rises to the surface?
	A $0.13\,\text{cm}^3$ **B** $0.17\,\text{cm}^3$ **C** $6.0\,\text{cm}^3$ **D** $8.0\,\text{cm}^3$

8	A drawing pin (thumb tack) has a sharp point at one end and a flat surface at the other end.

sharp point   flat surface

The pin is pushed into a wooden board.

How do the pressure and the force at the sharp point compare with the pressure and the force on the flat surface?

	force at the sharp point	pressure at the sharp point
A	greater than on the flat surface	greater than on the flat surface
B	greater than on the flat surface	less than on the flat surface
C	the same as on the flat surface	greater than on the flat surface
D	the same as on the flat surface	less than on the flat surface

9	An object is 20 cm below the surface of a liquid. The density of the liquid is $1200\,\text{kg}/\text{m}^3$.
	What is the pressure on the object due to the liquid?
	A $600\,\text{Pa}$ **B** $2400\,\text{Pa}$ **C** $60\,000\,\text{Pa}$ **D** $240\,000\,\text{Pa}$

10	A bubble of gas is formed deep under water. The bubble has a volume of $40\,\text{cm}^3$ and the pressure inside the bubble is P.
	The bubble rises up through the water. The volume of the bubble increases to $56\,\text{cm}^3$ and the pressure becomes 100 kPa. The temperature of the gas does not change.
	What is the initial pressure P?
	A 71 Pa **B** 71 kPa **C** 140 Pa **D** 140 kPa

11	The density of mercury is $13\,600\,\text{kg}/\text{m}^3$. What is the pressure at the bottom of a column of mercury that has a height of $75.0\,\text{cm}$? **A** $1.02 \times 10^4\,\text{Pa}$ **B** $1.02 \times 10^5\,\text{Pa}$ **C** $1.02 \times 10^6\,\text{Pa}$ **D** $1.02 \times 10^7\,\text{Pa}$