

1.8 Pressure

Question Paper

Level	IGCSE
Subject	Physics (0625)
Exam Board	Cambridge International Examinations(CIE)
Topic	General Physics
Sub Topic	1.8 Pressure
Booklet	Question Paper

Time Allowed: 47 minutes

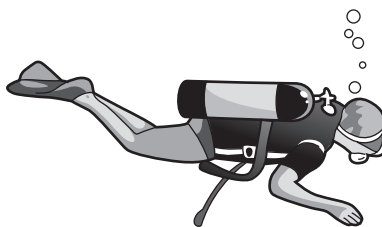
Score: /39

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

- 1 A diver under water uses breathing apparatus at a depth where the pressure is 1.25×10^5 Pa.



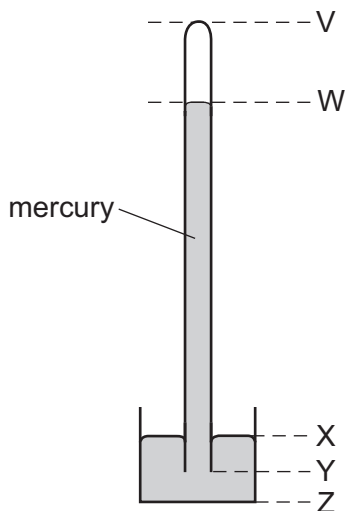
A bubble of gas breathed out by the diver has a volume of 20 cm^3 when it is released. The bubble moves upwards to the surface of the water.

At the surface of the water, the atmospheric pressure is 1.00×10^5 Pa.

The temperature of the water is the same at all depths.

What is the volume of this bubble when it reaches the surface?

- A** 15 cm^3 **B** 16 cm^3 **C** 20 cm^3 **D** 25 cm^3
- 2 The diagram shows a simple mercury barometer.



The atmospheric pressure increases.

Which distance increases?

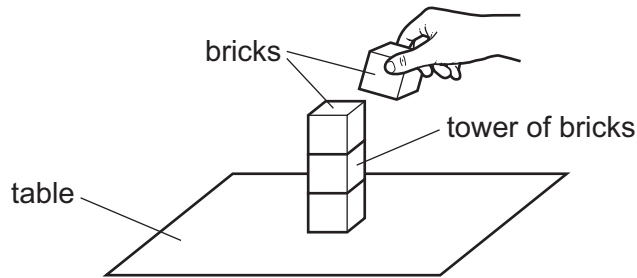
- A** VW **B** WY **C** XY **D** XZ

3 A force acts on an area to produce a pressure.

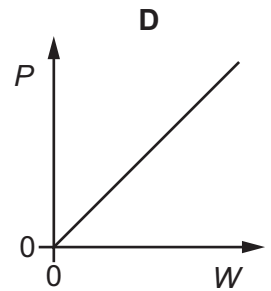
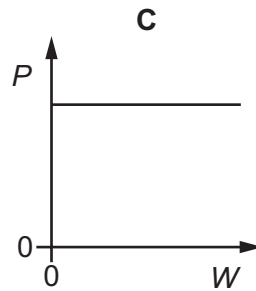
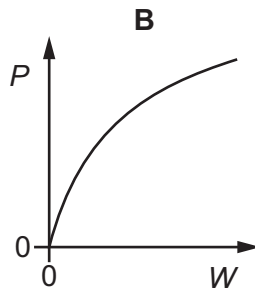
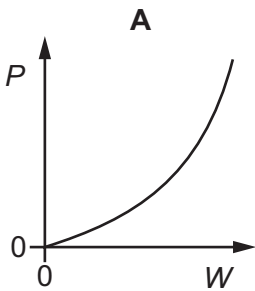
Which changes produce the same pressure?

- A double the area and double the force
- B double the area and halve the force
- C double the area and make the force four times bigger
- D halve the area and double the force

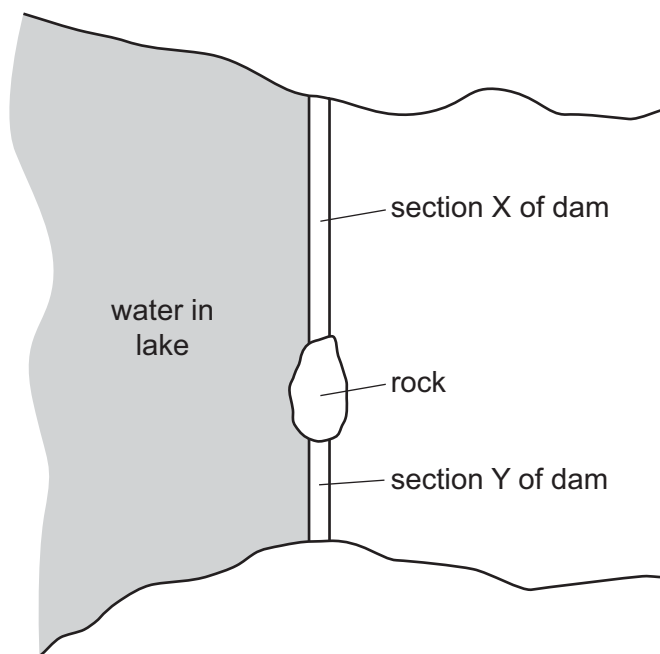
4 Identical toy bricks are placed one on top of another to make a tower on a table.



Which graph shows the relationship between the pressure P that the tower exerts on the table and the weight W of the tower?



- 5 A dam across a lake is divided into two sections by a rock. Section X is longer than section Y but the two sections are otherwise identical. The water in the lake by the dam is the same depth everywhere. The diagram shows a view from above of the lake and the dam.

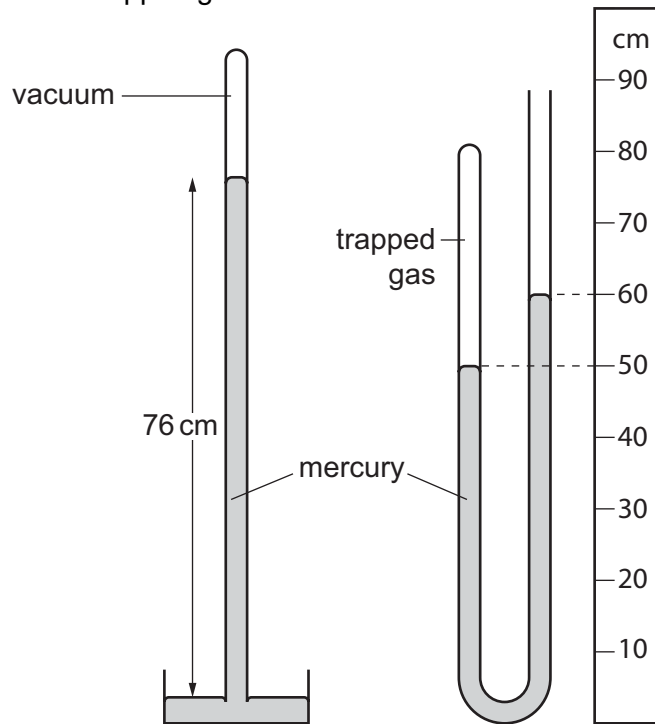


The water creates a total force on each section of the dam and an average pressure on each section of the dam.

Which statement is correct?

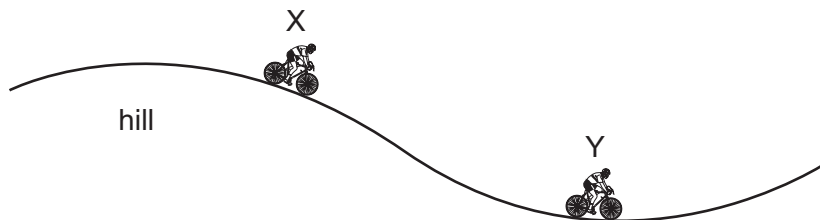
- A** The average pressure on X equals the average pressure on Y.
- B** The average pressure on X is less than the average pressure on Y.
- C** The total force on X equals the total force on Y.
- D** The total force on X is less than the total force on Y.

- 6 The diagram shows a simple mercury barometer alongside a mercury manometer. The manometer contains some trapped gas.



What is the pressure of the trapped gas?

- A 10 cm of mercury
 - B 50 cm of mercury
 - C 66 cm of mercury
 - D 86 cm of mercury
- 7 A cyclist travels down a hill from rest at point X, without pedalling.
The cyclist applies his brakes and the cycle stops at point Y.

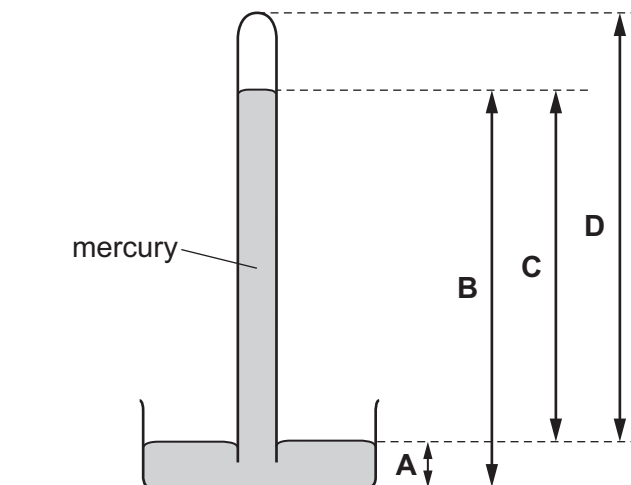


Which energy changes have taken place between X and Y?

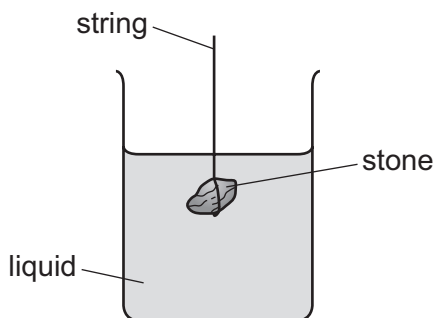
- A gravitational potential → kinetic → thermal (heat)
- B gravitational potential → thermal (heat) → kinetic
- C kinetic → gravitational potential → thermal (heat)
- D kinetic → thermal (heat) → gravitational potential

8 The diagram shows a simple mercury barometer.

Which height is used as a measurement of atmospheric pressure?



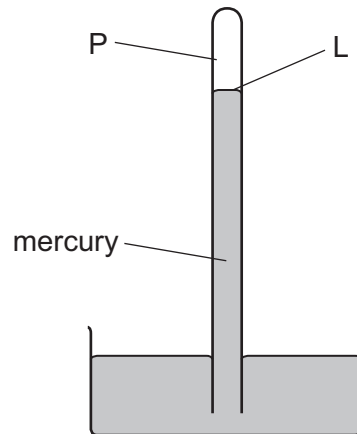
9 The diagram shows a stone suspended under the surface of a liquid from a string. The stone experiences a pressure caused by the liquid.



What would increase the pressure on the stone?

- A decreasing the surface area of the stone
- B increasing the mass of the stone
- C lowering the stone deeper into the liquid
- D using a liquid with a lower density

10 The diagram shows a simple mercury barometer, used to measure atmospheric pressure.

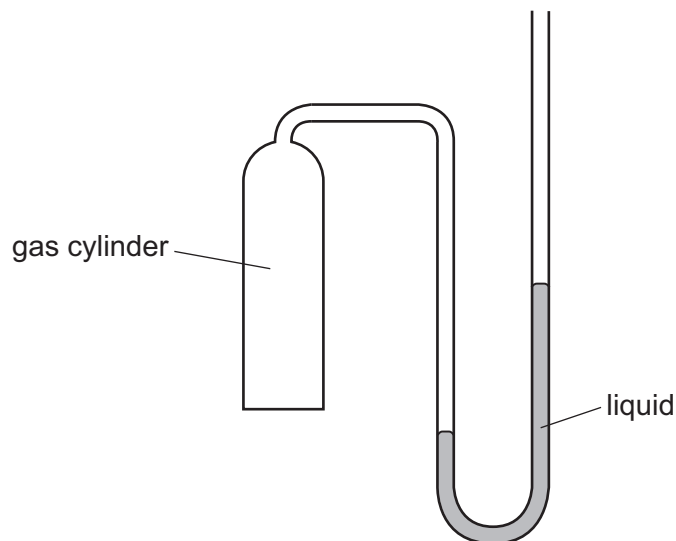


Atmospheric pressure decreases.

Which row states what happens to the pressure at point P and what happens to the level L?

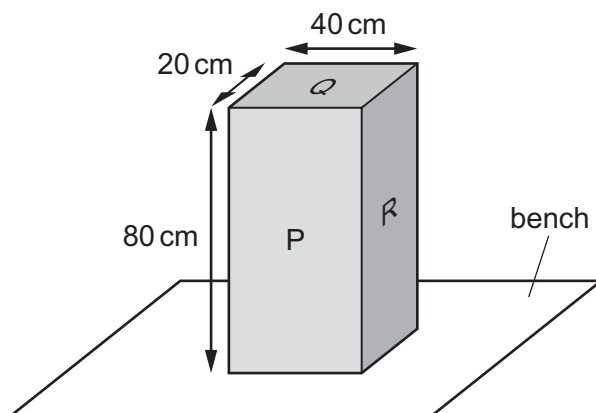
	pressure at P	level L
A	decreases	falls
B	decreases	rises
C	stays the same	falls
D	stays the same	rises

- 11 The diagram shows a manometer with one side connected to a gas cylinder and the other side open to the atmosphere.



Which conclusion can be made using only the information from liquid levels in the manometer?

- A The density of the gas is less than the density of air.
 - B The density of the gas is greater than the density of air.
 - C The pressure of the gas is less than atmospheric pressure.
 - D The pressure of the gas is greater than atmospheric pressure.
- 12 The diagram shows a solid block resting on a bench. The dimensions of the block are shown.

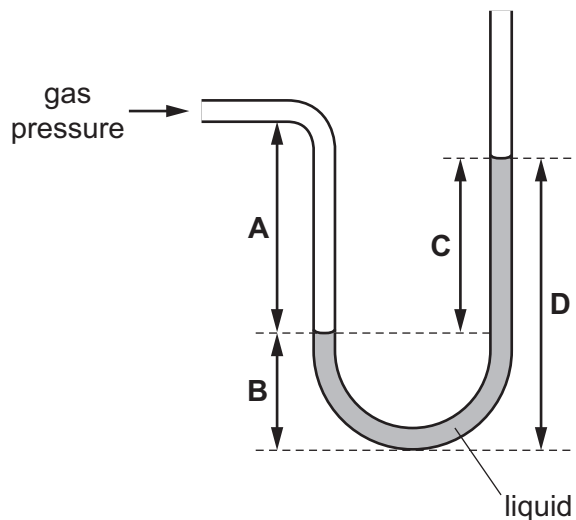


On which labelled surface should the block rest to produce the smallest pressure on the bench?

- A P
- B Q
- C R
- D any of P, Q or R

- 13 The diagram shows a manometer containing a liquid. The manometer is used to find the difference between the pressure of a gas and atmospheric pressure.

Which distance represents this pressure difference?



- 14 Four physics teachers investigate pressure. They wear identical clothes and lie on different beds of nails.

The table gives the weight of each teacher and the total area of contact between the teacher and the nails.

Which teacher experiences the least pressure from the nails?

	weight of teacher / N	total area of contact / cm ²
A	700	13
B	800	20
C	900	14
D	1000	21

- 15 The table gives four forces and the surface area on which each force acts.

Which row gives the largest pressure on the surface?

	force/N	area/m ²
A	20	2
B	40	2
C	20	4
D	40	4

- 16 What does a barometer measure?

- A** the current in a circuit
- B** the density of a liquid
- C** the pressure of air
- D** the temperature of an object

- 17 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

18 A vehicle sinks into soft ground.

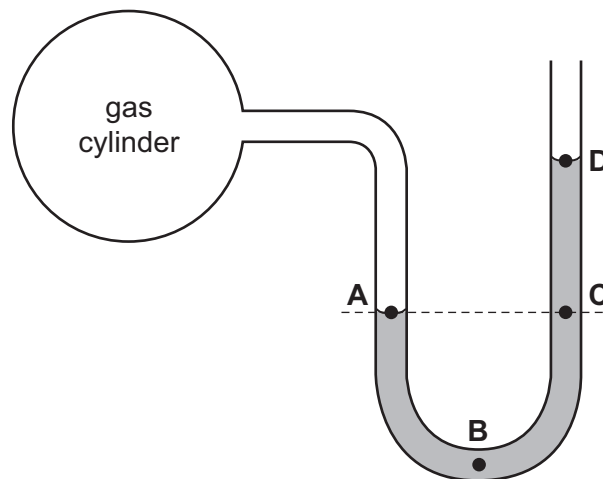
The vehicle is changed so that it does not sink as far.

Which change is made?

- A a lower centre of mass
- B a more powerful engine
- C wheels that are further apart
- D wider tyres

19 A manometer is used to measure the pressure of a gas trapped in a cylinder.

At which labelled point on the diagram is the pressure greatest?

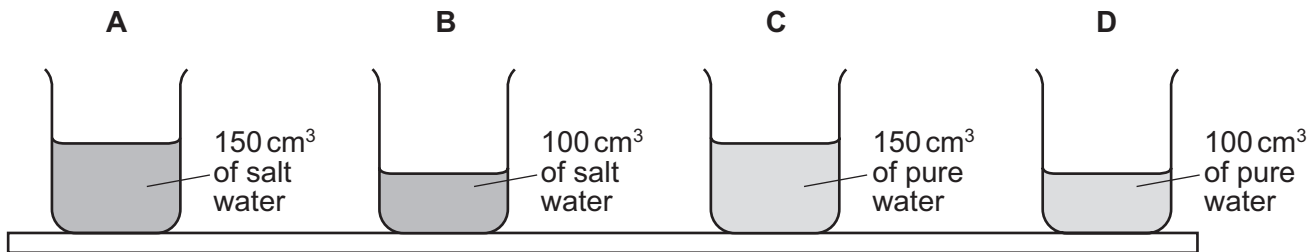


- 20 Which situation is an example of a force acting over a large area to produce a small pressure?
- A a builder hammering a nail into a piece of wood
 - B a cook using a sharp knife to cut vegetables
 - C a nurse pushing a needle into a patient's arm
 - D a soldier marching in flat-soled boots

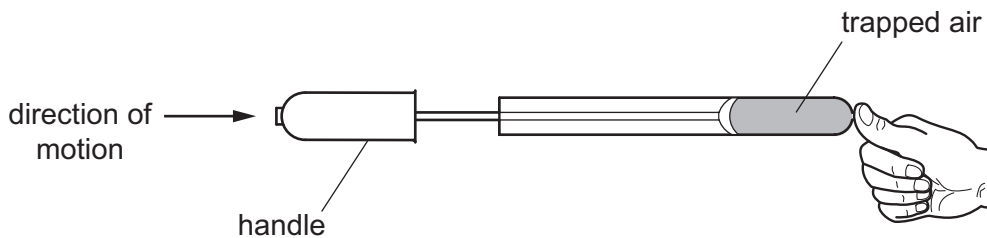
21 A student places four identical beakers on a bench.

Two beakers contain salt water of density 1.1 g/cm^3 and two beakers contain pure water of density 1.0 g/cm^3 .

Which beaker exerts the greatest pressure on the bench?



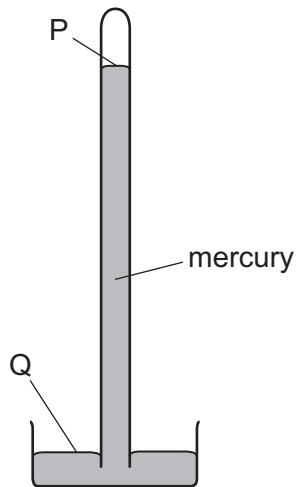
22 A student places his thumb firmly on the outlet of a bicycle pump, to stop the air coming out.



What happens to the pressure and what happens to the volume of the trapped air as the pump handle is pushed in?

	pressure	volume
A	decreases	decreases
B	decreases	remains the same
C	increases	decreases
D	increases	remains the same

23 The diagram shows a simple mercury barometer.



Atmospheric pressure decreases.

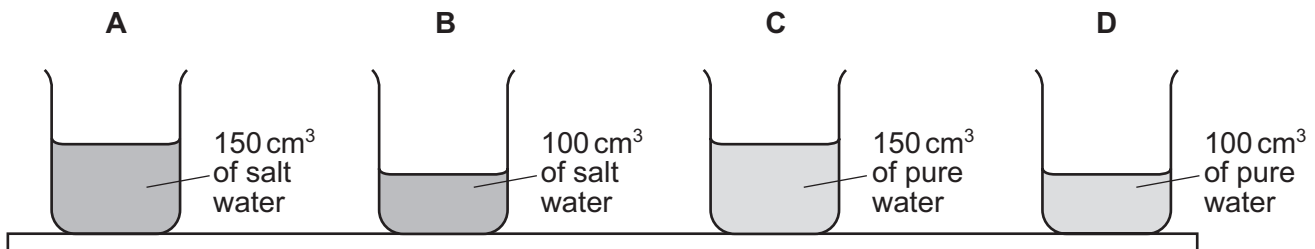
What happens to the level of the mercury at P and what happens to the level of the mercury at Q?

	P	Q
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

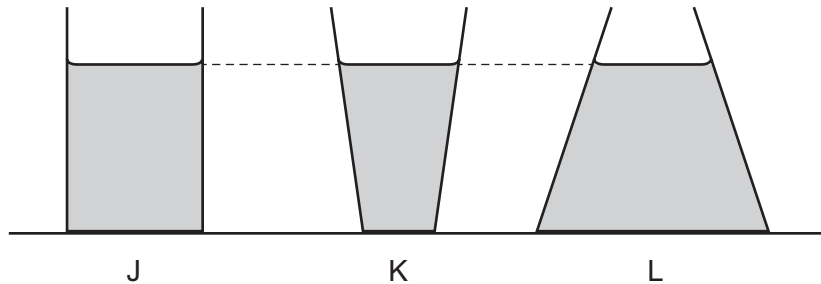
24 A student places four identical beakers on a bench.

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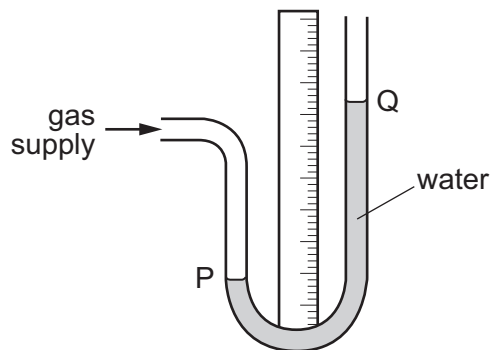


- 25 The diagram shows three different containers J, K and L. Each container contains water of the same depth.



Which statement about the pressure of the water on the base of each container is correct?

- A The water pressure is greatest in container J.
 - B The water pressure is greatest in container K.
 - C The water pressure is greatest in container L.
 - D The water pressure is the same for all three containers.
- 26 A water manometer is connected to a gas supply.

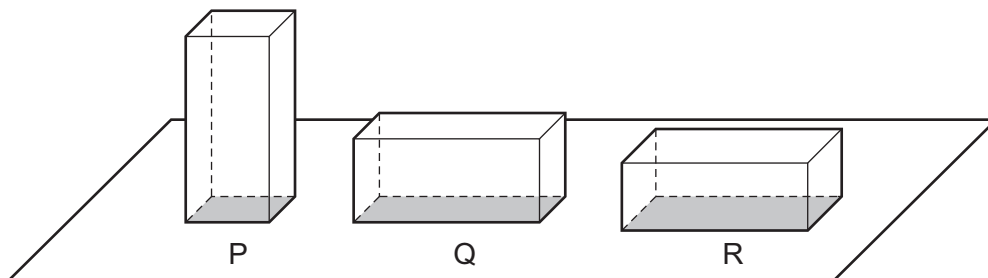


There is a gas leak and the pressure of the gas supply falls.

What happens to the water level at P and what happens to the water level at Q?

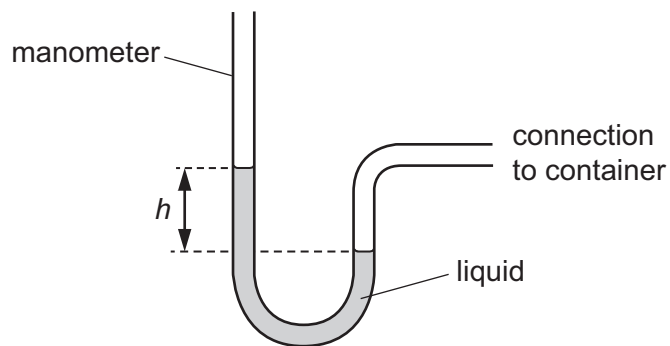
	water level at P	water level at Q
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

- 27 The scale diagram shows three identical blocks, P, Q and R. The blocks have different areas of contact with the ground.



Which block exerts the greatest pressure on the ground?

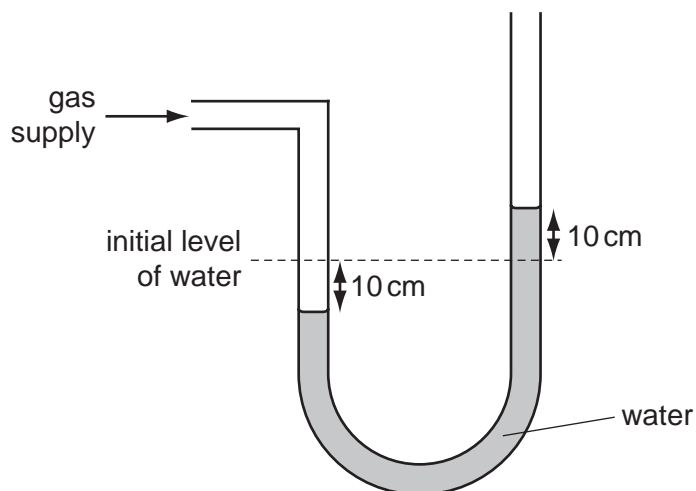
- A block P
 - B block Q
 - C block R
 - D they all exert the same pressure
- 28 A manometer is used to measure the pressure of the air in a container.



Which change would give a bigger value of height h ?

- A using a less dense liquid
- B using a more dense liquid
- C using a narrower tube
- D using a wider tube

29 A water manometer is used to measure the pressure of a gas supply.

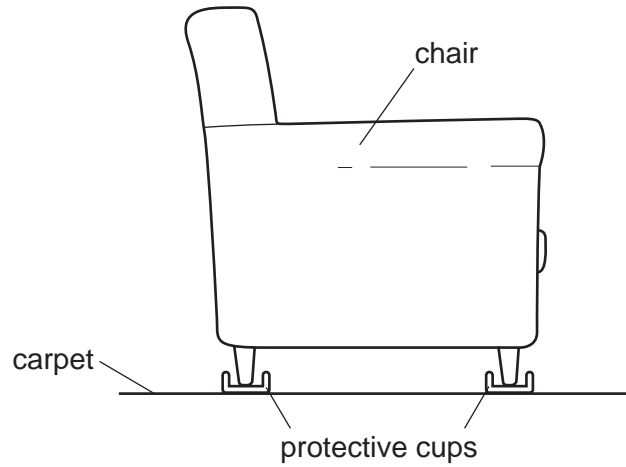


When it is attached to the gas supply, the water falls on the left side and rises on the right side. The difference in the levels of water on the two sides is now 20 cm.

What is the pressure of the gas supply?

- A the pressure due to 10 cm depth of water
- B the pressure due to 20 cm depth of water
- C the pressure due to 10 cm depth of water plus atmospheric pressure
- D the pressure due to 20 cm depth of water plus atmospheric pressure

30 A chair is placed on protective cups to prevent damage to the carpet underneath it.



How do the cups change the area of contact with the carpet and the pressure on it?

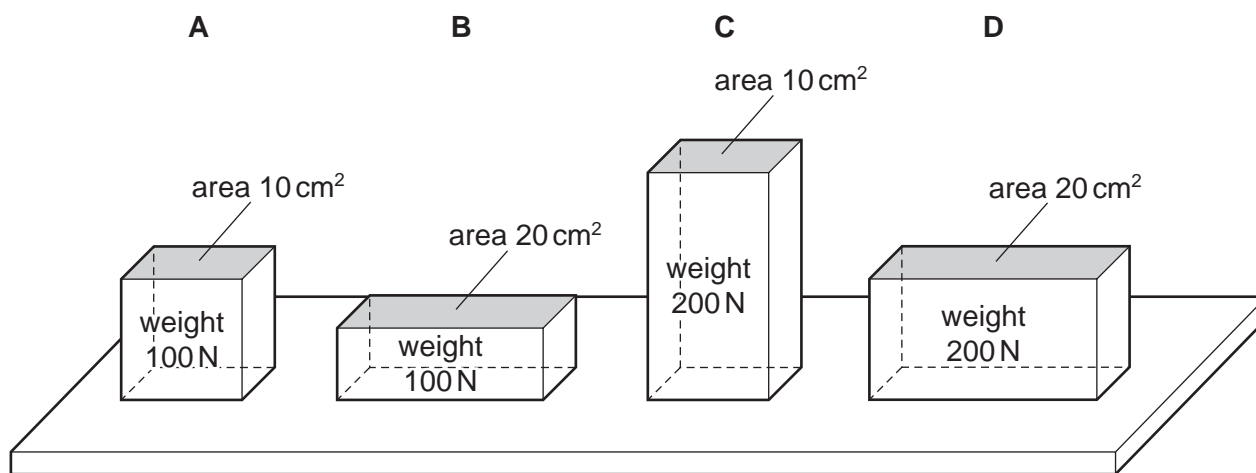
	area of contact	pressure
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	increased	increased

31 It is dangerous for submarines to dive to very great depths.

Why is it dangerous?

- A The density of water is less at greater depths.
- B The pressure of water is greater at greater depths.
- C The temperature of water is higher at greater depths.
- D The weight of the submarine is greater at greater depths.

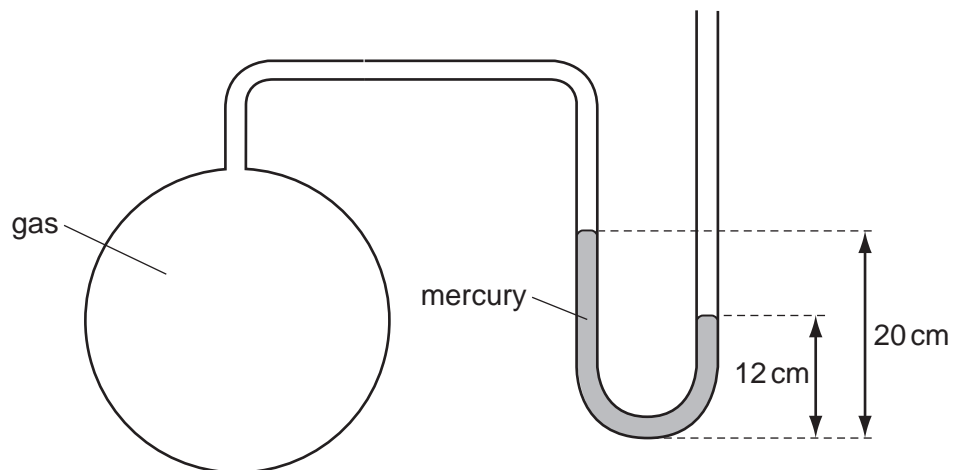
32 Which block exerts the greatest pressure on the surface below it?



33 Which statement is explained by reference to pressure?

- A Objects with greater mass have greater weight.
- B One kilogram of water occupies more volume than one kilogram of lead.
- C Spikes on running-shoes sink into the ground.
- D Water cooled to a low enough temperature turns to ice.

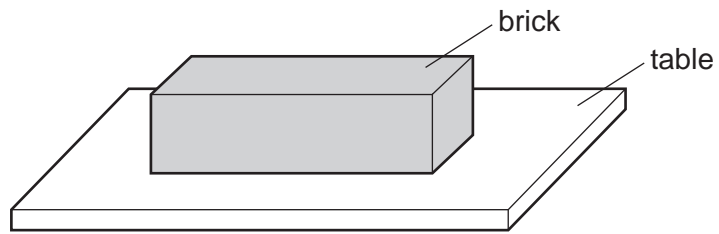
- 34 The diagram shows a mercury manometer used to measure the pressure of gas in a container. Atmospheric pressure is 76 cm of mercury.



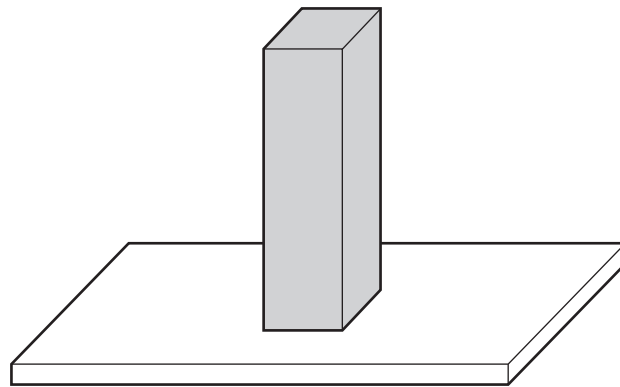
What is the pressure of the gas?

- A 56 cm of mercury
 - B 68 cm of mercury
 - C 84 cm of mercury
 - D 96 cm of mercury
- 35 What does a barometer measure?
- A atmospheric density
 - B atmospheric pressure
 - C liquid density
 - D liquid pressure
- 36 In which position would a boy exert the **most** pressure on the ground?
- A lying on his back
 - B sitting down
 - C standing on one foot
 - D standing on two feet

37 A brick with flat, rectangular sides rests on a table.



The brick is now turned so that it rests on the table on its smallest face.



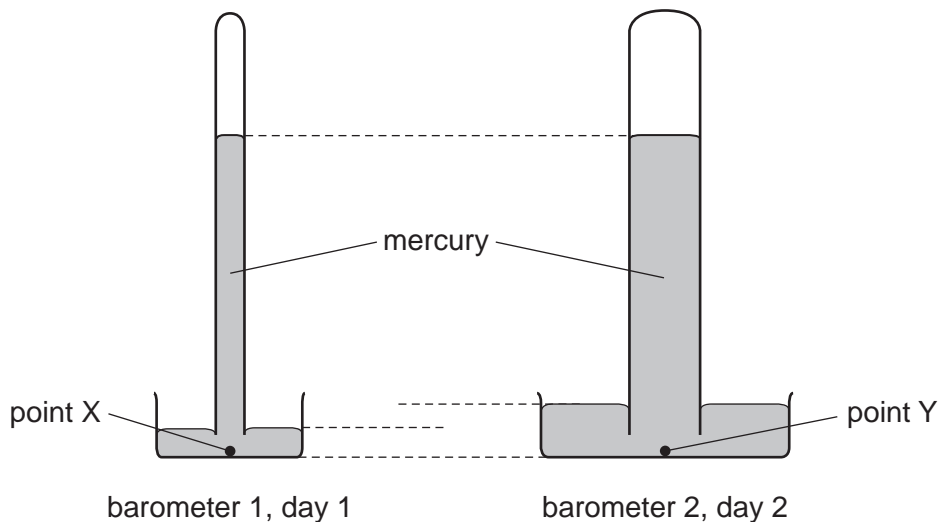
How has this affected the force and the pressure exerted by the brick on the table?

	force	pressure
A	increased	increased
B	increased	unchanged
C	unchanged	increased
D	unchanged	unchanged

38 The diagram shows two mercury barometers.

Barometer 1 is measuring atmospheric pressure on day 1.

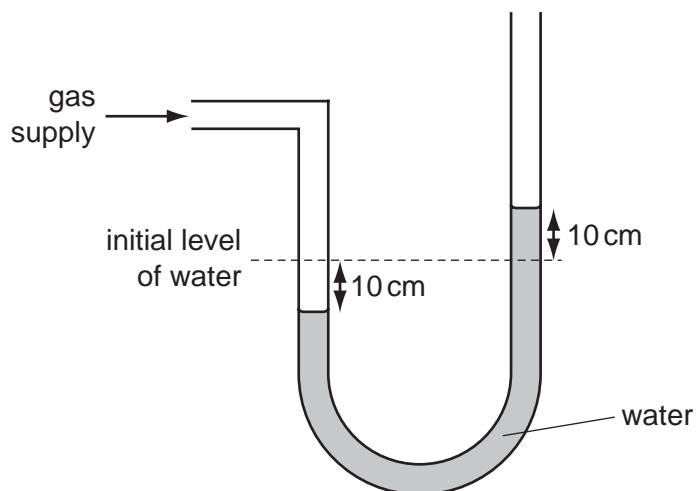
Barometer 2 is measuring atmospheric pressure on day 2.



Which statement is true?

- A** The atmospheric pressure on day 1 is less than the atmospheric pressure on day 2.
- B** The atmospheric pressure on day 1 is the same as the atmospheric pressure on day 2.
- C** The pressure at point X is less than the pressure at point Y.
- D** The pressure at point X is the same as the pressure at point Y.

39 A water manometer is used to measure the pressure of a gas supply.



When it is attached to the gas supply, the water falls on the left side and rises on the right side. The difference in the levels of water on the two sides is now 20 cm.

What is the pressure of the gas supply?

- A** the pressure due to 10 cm depth of water
- B** the pressure due to 20 cm depth of water
- C** the pressure due to 10 cm depth of water plus atmospheric pressure
- D** the pressure due to 20 cm depth of water plus atmospheric pressure