Pressure – 2022 November IGCSE 0625

1. Nov/2022/Paper_11/No.11

Which quantities, in addition to the acceleration of free fall *g*, affect the pressure at the bottom of a pond of water?

A the density of the water and the depth of the pond only

B the density of the water and the surface area of the pond only

C the depth of the pond and the surface area of the pond only

D the depth of the pond, the density of the water and the surface area of the pond

2. Nov/2022/Paper_12/No.11

A pressure gauge is lowered into the sea. Measurements of the pressure and depth are taken as the pressure gauge is lowered.

Which statement describes how and why the pressure changes as the gauge is lowered?

A The density of the sea water decreases so the pressure increases.

B The depth of the gauge below the surface of the sea increases so the pressure increases.

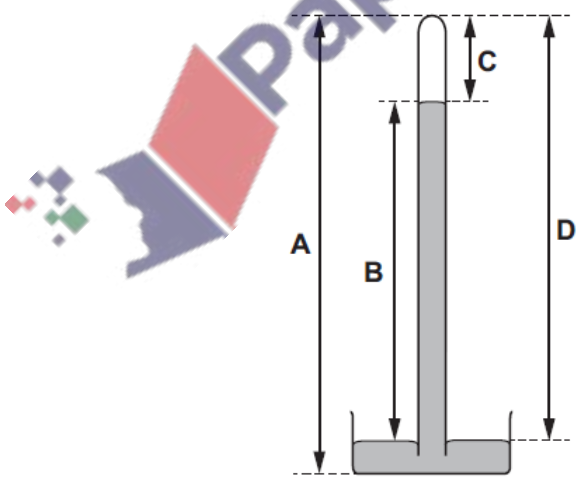
C The height of the gauge above the sea bed decreases so the pressure decreases.

D The temperature of the sea water decreases so the pressure decreases.

3. Nov/2022/Paper_13/No.11

The diagram shows a simple mercury barometer.

Which labelled distance decreases when atmospheric pressure increases?



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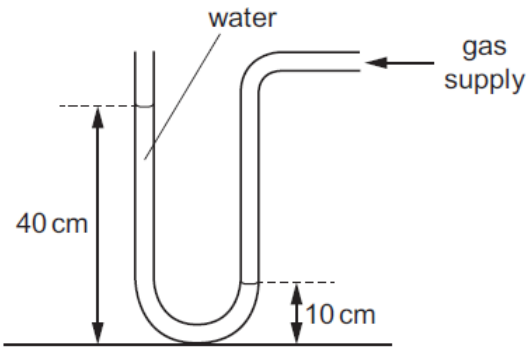
4. Nov/2022/Paper_21/No.11

A manometer containing water is used to measure the pressure of a gas supply, as shown.



The density of water is 1000 kg / m^3.

What is the pressure of the gas supply?

A 300 Pa above atmospheric pressure

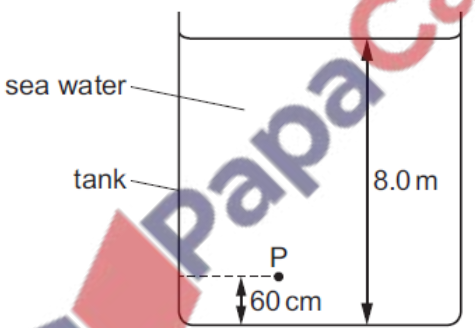
B 400 Pa above atmospheric pressure

C 3000 Pa above atmospheric pressure

D 4000 Pa above atmospheric pressure

5. Nov/2022/Paper_22/No.11

The diagram shows a tank containing sea water.



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The density of the sea water is 1020 kg / m^3.

What is the pressure at point P relative to atmospheric pressure?

A 7400 Pa above atmospheric pressure

B 7500 Pa above atmospheric pressure

C 75 000 Pa above atmospheric pressure

D 82 000 Pa above atmospheric pressure

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6. Nov/2022/Paper_23/No.11

A measuring cylinder of cross-sectional area 4.0 cm^2 contains 224 cm^3 of liquid.

The pressure of the liquid at the base of the measuring cylinder due to the liquid is 8800 Pa.

What is the density of the liquid?

A 224 kg/m^3 **B** 385 kg/m^3 **C** 1600 kg/m^3 **D** 2200 kg/m^3

7. Nov/2022/Paper_31/No.4(c)

(c) The weight of a table is 280 N. The table has four legs. The area of each table leg in contact with the floor is 18 cm^2.

Calculate the pressure of the table on the floor. Give the correct unit.

pressure on the floor = ... unit ..... [5]

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8. Nov/2022/Paper_31/No.5(a)

An engineer measures the pressure of the gas in a gas bottle. Fig. 5.1 shows the measuring device he uses, connected to the gas bottle.

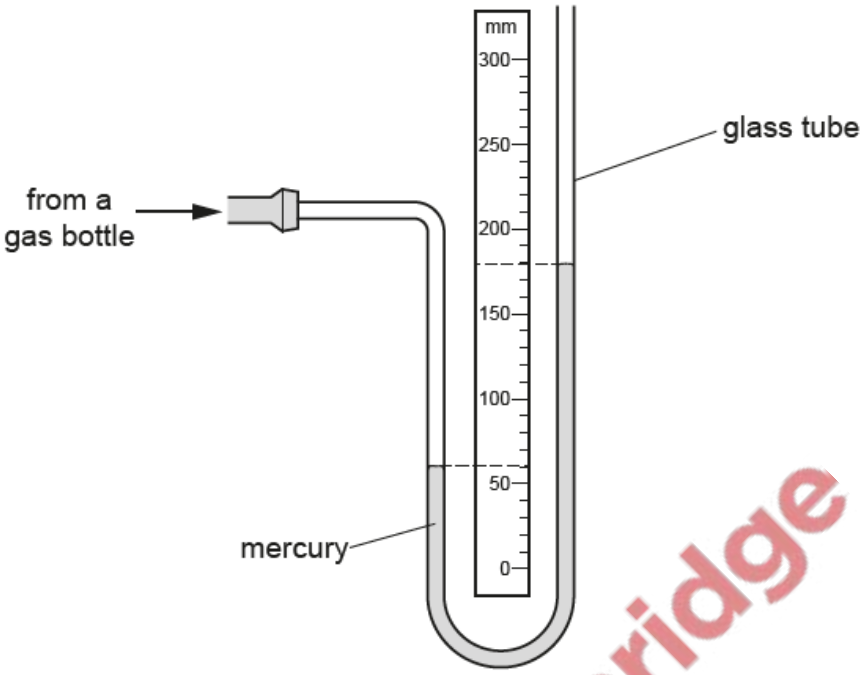

Fig. 5.1

(a) (i) Atmospheric pressure is 756 mm of mercury.

Calculate the pressure of the gas in the gas bottle.

pressure of gas = ... mm of mercury [3]

(ii) State the name of the measuring device shown in Fig. 5.1.

..... [1]

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9. Nov/2022/Paper_32/No.2

A device for measuring gas pressure is connected to a gas supply as shown in Fig. 2.1

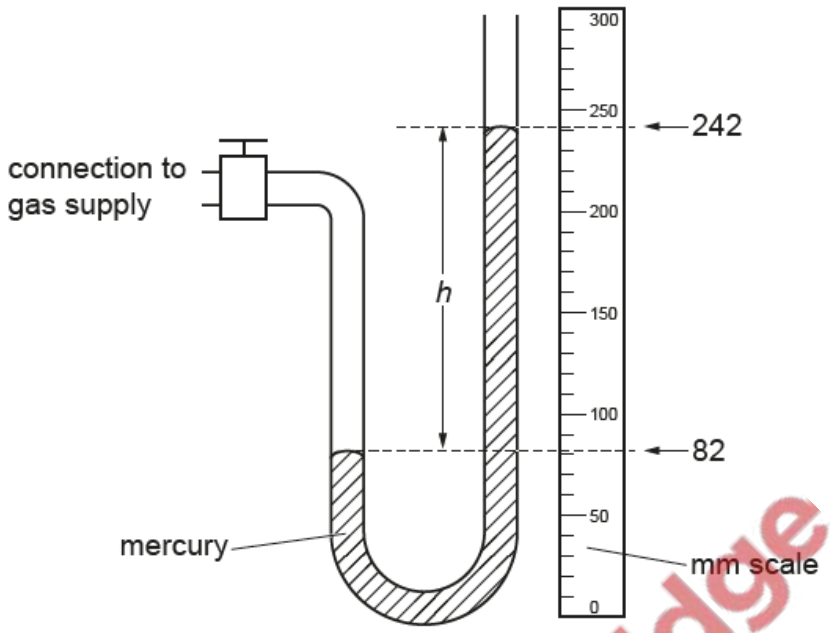

Fig. 2.1

(a) (i) State the name of the measuring device shown in Fig. 2.1.

.....[1]

(ii) Determine the difference *h* between the mercury levels shown in Fig. 2.1.

h = ... mm [2]

(b) The atmospheric pressure is 760 mm of mercury.

Determine the pressure of the gas supply.

pressure of gas supply = ... mm of mercury [1]

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(c) Suggest why this measuring device uses mercury rather than coloured water.

..... [1]

(d) The gas supply is turned off and the device is disconnected from the gas supply. Both ends of the tube are open to the atmosphere.

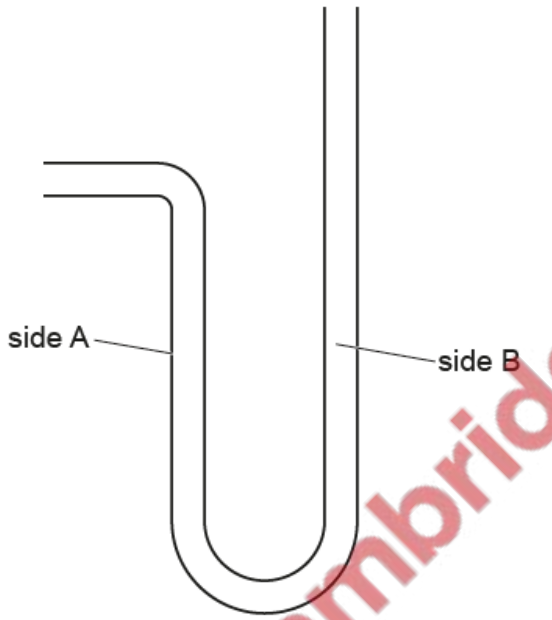

Fig. 2.2

On Fig. 2.2, draw and label the levels of mercury in side A and in side B of the tube. [1]

[Total: 6]

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10. Nov/2022/Paper_41/No.4(a)

A quantity of gas is trapped by a piston in a cylinder with thin metal walls. The piston is free to move without friction within the cylinder.

Fig. 4.1 shows the cylinder and piston.

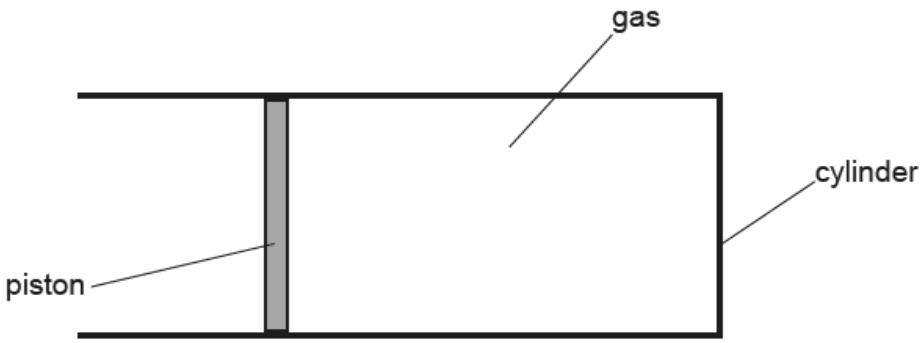

Fig. 4.1

The cylinder is placed inside a freezer.

(a) The air in the freezer is at atmospheric pressure, which is 1.0×10^5 Pa. The area of the piston in contact with the air in the freezer is 2.4×10^{-3} m^2.

(i) Calculate the force exerted on the piston by the air in the freezer.

force = ... [2]

(ii) When the cylinder is first placed into the freezer, the temperature of the gas in the cylinder decreases and the air pushes the piston into the cylinder.

Calculate the work done on the piston by the air in the freezer as the air pushes the piston a distance of 0.021 m into the cylinder.

work done = ... [2]

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11. Nov/2022/Paper_42/No.1(c)

(c) The water stops flowing. The depth of water in the tank is 0.800 m.

Calculate the pressure at the bottom of the tank due to the water.

pressure = ... [3]

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12. Nov/2022/Paper_42/No.4

(a) Explain, in terms of the momentum of particles, how a gas exerts a pressure.

.....

.....

.....

..... [3]

(b) The temperature of a sample of gas is increased at constant volume.

State and explain any change in the pressure of the gas.

.....

.....

.....

..... [2]

(c) Another sample of gas is in a sealed container of volume 170 cm^3 and exerts a pressure of 9.0×10^4 Pa. The volume of the container decreases by 70 cm^3 at constant temperature.

Calculate the new pressure of the gas.

pressure = ... [3]

[Total: 8]

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