U tube manometer:
---

- A U-tube manometer is an instrument to measure the pressure of a gas.
- The pressure of the gas, forces the liquid in the manometer to rise up on the open side of the u-tube till it stops rising any further. The height difference between the two levels is the measure of the pressure of the gas.
- The excess pressure of the gas (that is its pressure above atmospheric pressure is equal to the pressure due to the difference in the level of liquid on each side)

===
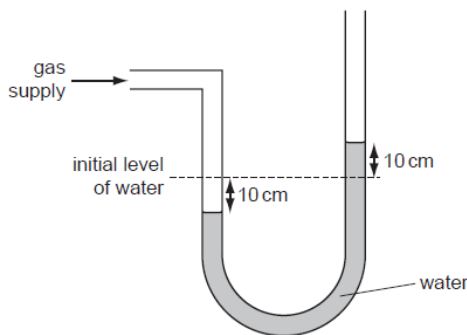
Example:

When the manometer is attached to a gas supply, the level of the water on the left falls and that on the right rises. **The pressure of the gas supply is =**
the pressure due to the 20cm depth of the water + the atmospheric pressure.

---

Suppose there is a gas leak and the pressure of the gas supply falls. In that case the water level at P rises and the water level at Q falls
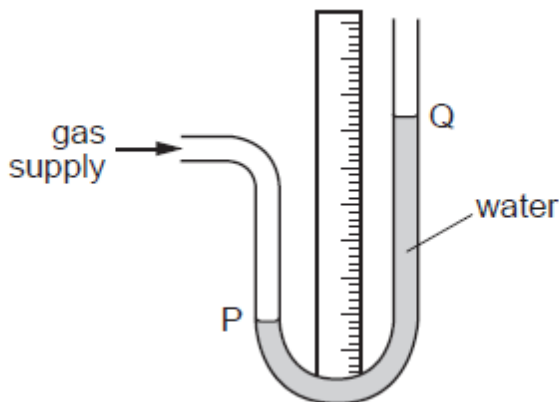
Explanation:

The gas pressure falls and becomes less that the atmospheric pressure. So the atmosphere pushes on the water on side Q.

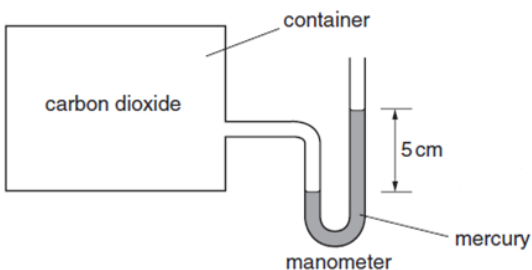---

A water manometer is used to measure the pressure of gas supply to houses because if mercury is used then the value of h would be too small.
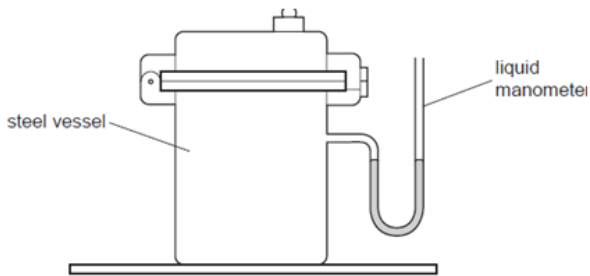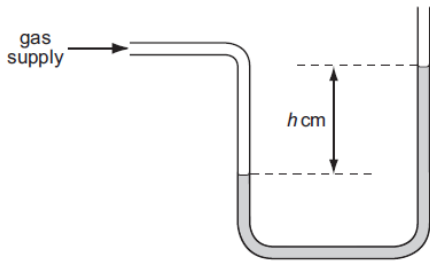
Suppose the level of the liquid on both arms of the manometer is the same, then that means that the gas pressure is equal to the atmospheric pressure.
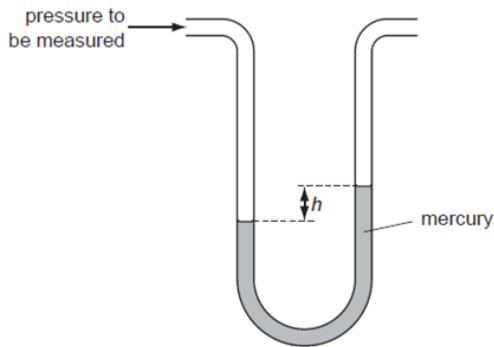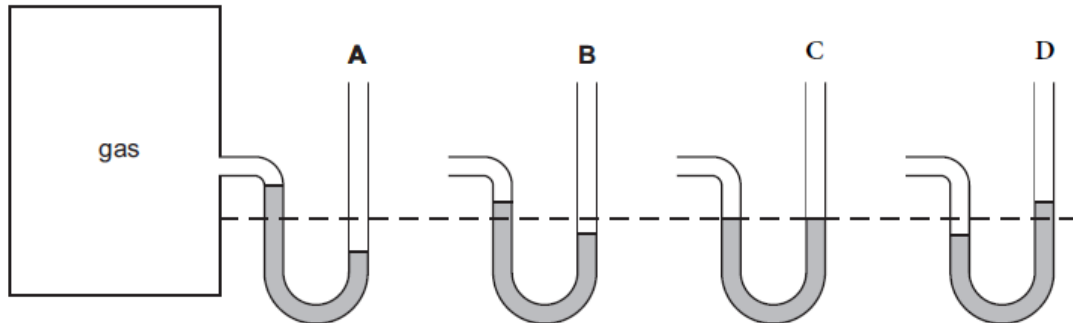
For a less dense liquid , the value of" h" increases.

The pressure exerted by carbondioxide = 5cm of mercury above the atmospheric pressure

--

0625/01/M/J/06

12 A manometer is being used to measure the pressure of the gas inside a tank. **A**, **B**, **C** and **D**

show the manometer at different times.

At which time is the gas pressure inside the tank greatest?

----

11 A mercury manometer is used to measure a pressure difference. The difference is shown by the
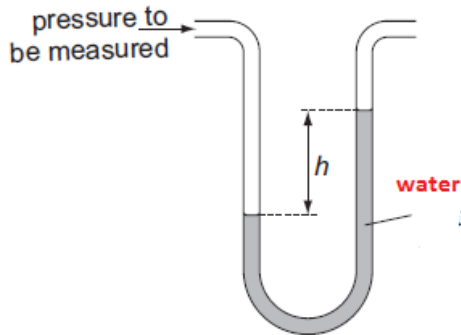levels X and Y in the diagram.

0625/12/M/J/13

What is the pressure difference represented by X and Y?
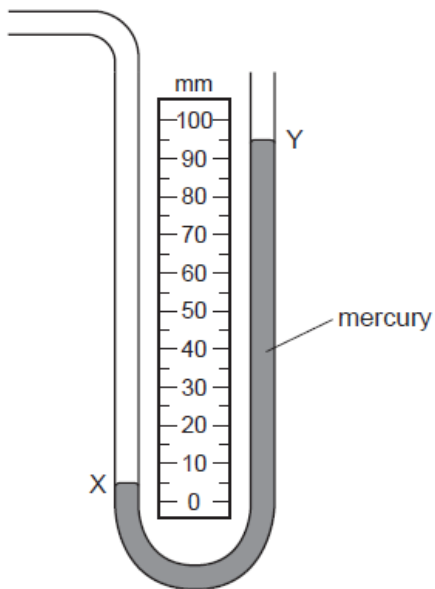
A 5 mm of mercury

B 50 mm of mercury

C 90 mm of mercury

D 95 mm of mercury

**12** A pressure is measured using a manometer as shown in the diagram.

The water in the manometer is replaced with a liquid which is more dense. How does the value of *h* change?

A   It becomes zero.

B   It decreases, but not to zero.

C   It stays the same.

D   It increases.

---

11 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?

---
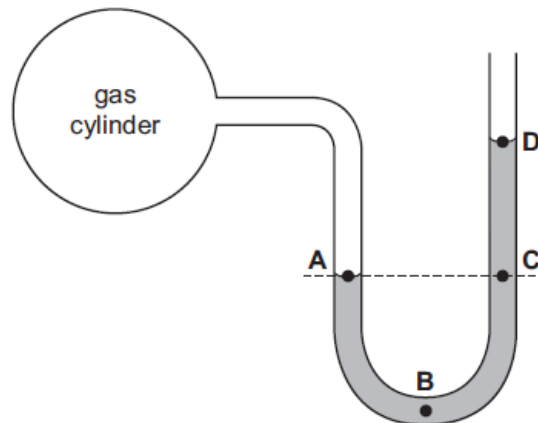
12 A force acts on an area to produce a pressure.

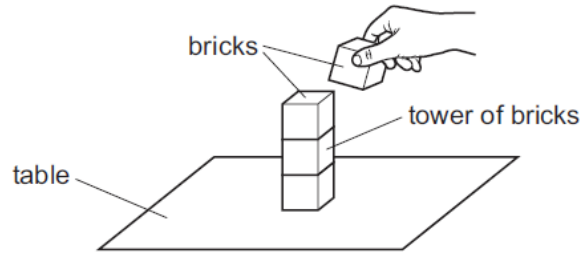Which changes produce the same pressure?

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

---

13 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?
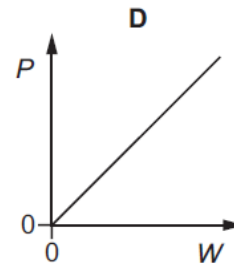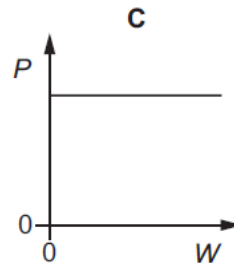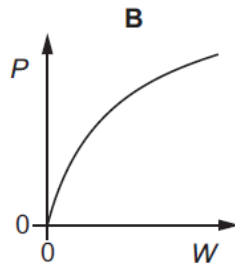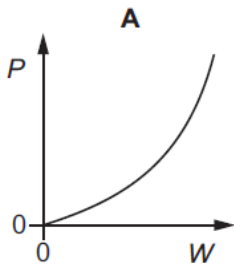
(b) Fig. 6.1 shows a flask connected to a pump and also to a manometer containing mercury.
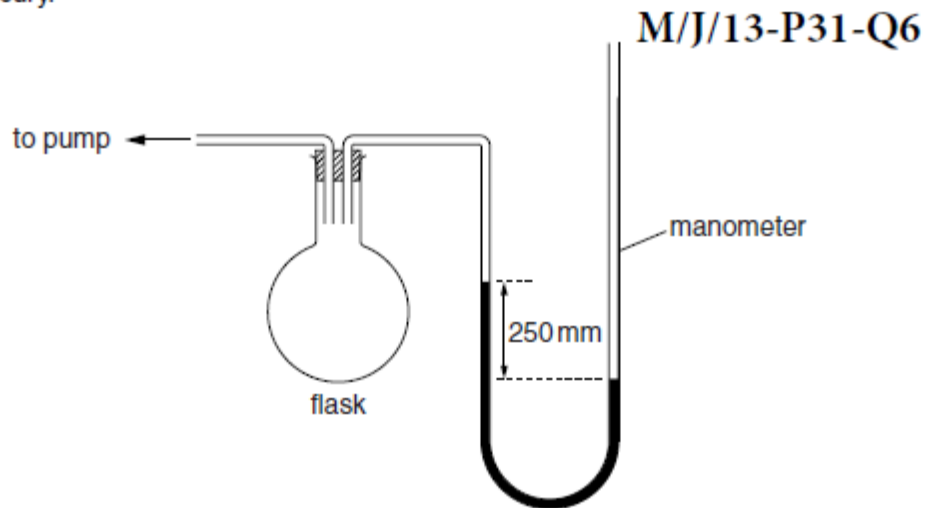
M/J/13-P31-Q6

to pump

manometer

250 mm

flask

Fig. 6.1

The right-hand tube of the manometer is open to the atmosphere.

The pump has been operated so that the mercury levels differ, as shown, by 250 mm. The density of mercury is 13 600 kg/m³.

(i) Calculate the pressure, in Pa, due to the 250 mm column of mercury.

pressure = ...[2]

(b) A lake is 5.0m deep. The density of the water is $1000 \, kg/m^3$.

(i) Calculate the pressure at the bottom of the lake due to this depth of water.

F/M/15-P42-Q5

pressure = ...[2]

(ii) A bubble of gas escapes from the mud at the bottom of the lake and rises to the surface.

Place one tick in each row of the table to indicate what happens to the volume, the mass and the density of the gas in the bubble. Assume that no gas or water vapour enters or leaves the bubble.

	increases	stays the same	decreases
volume of bubble			
mass of gas in bubble			
density of gas in bubble			

[2]

- -