NAME: ....

GAS LAWS

1. At a pressure of 2 atmospheres a fixed mass of hydrogen occupies a volume of 8 litres. What pressure must be maintained if the volume is to be increased to 10 litres, temperature remaining constant?

[Total 3m]

2. A certain mass of ammonia occupies 600 ml at a certain pressure. When the pressure is changed to 4 atmospheres it occupies a volume of 2.4 litres, temperature remaining constant. What was the initial pressure?

[Total 3m]

3. A bubble of air of volume 1cm^3 is released by a deep-sea diver at a depth where the pressure is 4.0 atmospheres. Assuming its temperature remains constant ($T_1 = T_2$) **what** is its volume just before it reaches the surface where the pressure is 1.0 atmosphere?
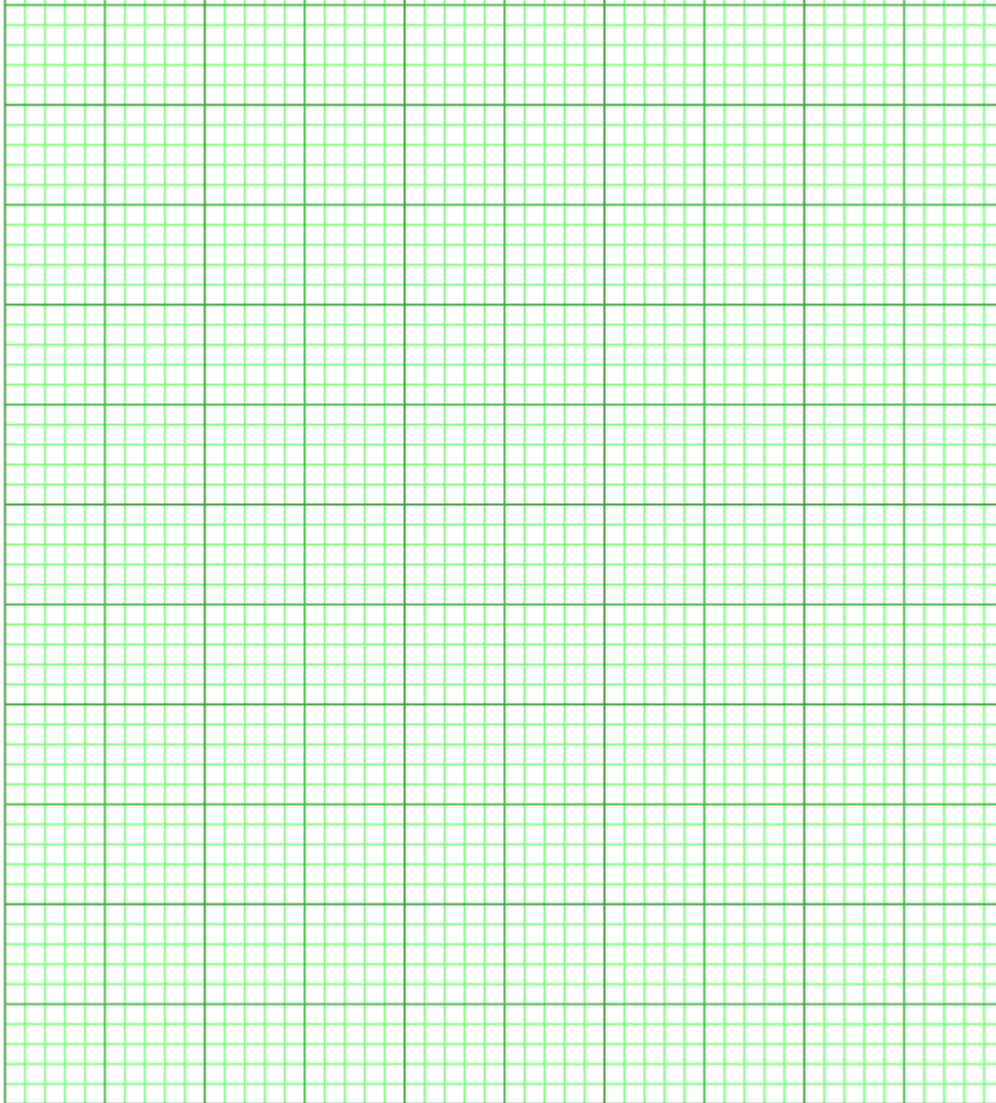
(3mks)

4. (a)   **State** what is meant by absolute zero temperature. (1mk)

(b)   **What** are the molecular differences between a real gas and ideal gas?   (2mks)

(c)   In an experiment to find the relationship between volume and temperature of a given mass of air at constant pressure the following
results were obtained

Volume (cm^3)	31	33	35	38	40	43
Temperature(^{0}c)	0	20	40	60	80	100

(i)   Plot an appropriate graph to show the relationship between volume and temperature.[3m]
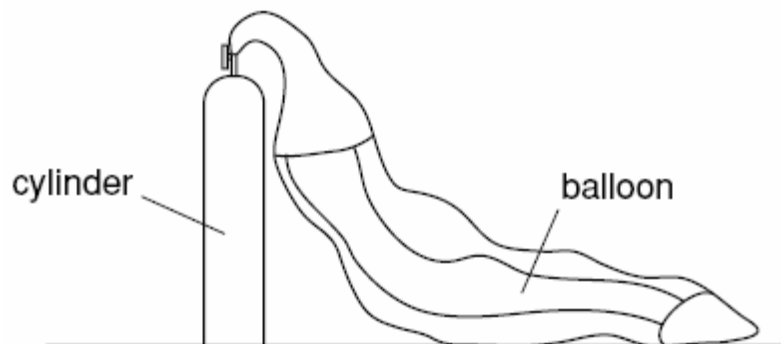
(ii)   Use the graph to **calculate** the increase in volume of the air per unit rise in temperature. (3mks)

(iii)   **Give a reason** why the volume of a real gas can not be reduced to zero by cooling.

(1mk)

5. The figure shows a weather balloon. The balloon is shown partly filled with gas from a cylinder.

The balloon contains no gas initially. When it is connected to the cylinder, gas enters the balloon. The pressure in the cylinder decreases.
(a) Explain why the molecules inside the cylinder
(i) Exert a large pressure initially,

[2]

(ii) Exert a smaller pressure in the cylinder when the balloon is filled.

[1]

(b) The volume of the cylinder is 0.0020m^3. The pressure inside the cylinder is initially 200 atmospheres.
When the cylinder is connected to the balloon, the final pressure in the cylinder and the balloon is 1.0 atmosphere. The temperature of the gas remains constant.
Calculate the final volume of gas in the balloon. State the equation that you use.

[3]

6. The volume of a given mass of gas, at 150°C is 400 ml. At what temperature, will it occupy a volume

of 600 ml at the
   same pressure?

[Total 4m]

7. 400 ml of a gas at 227°C is to be reduced to a volume of 300 ml. By what degrees Celsius, must the temperature be altered, keeping pressure constant?

[Total 4m]