NAME: ....

MEASUREMENTS 1

1. Fig. 1.1 shows a measuring cylinder containing some water.
A student allows 200 drops of water to fall into the water in the measuring
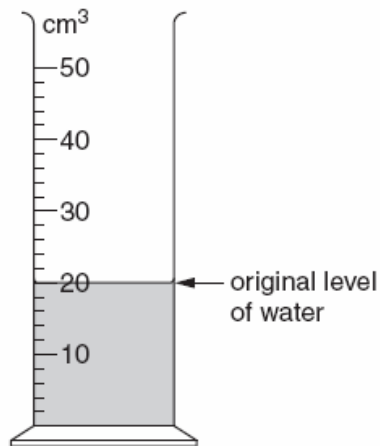cylinder. Fig. 1.2 shows the measuring cylinder after the addition of the drops.
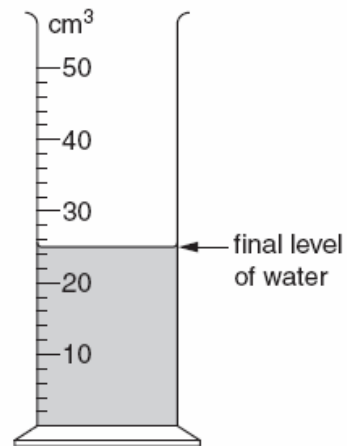

Fig. 1.1   Fig. 1.2

(a) State
(i) the original volume of water in the cylinder,

.... cm^3

(ii) the final volume of water in the cylinder.

.... cm^3
[1]
(b) Calculate the volume of water added.

volume added = ... cm³ [1]

(c) Calculate the average volume of one of the drops of water.

average volume = ... cm³ [2]
[Total: 4]

2. Wanyonyi investigated the relationship between mass and weight. He weighed five different masses using a force meter.

His results are shown in the table.

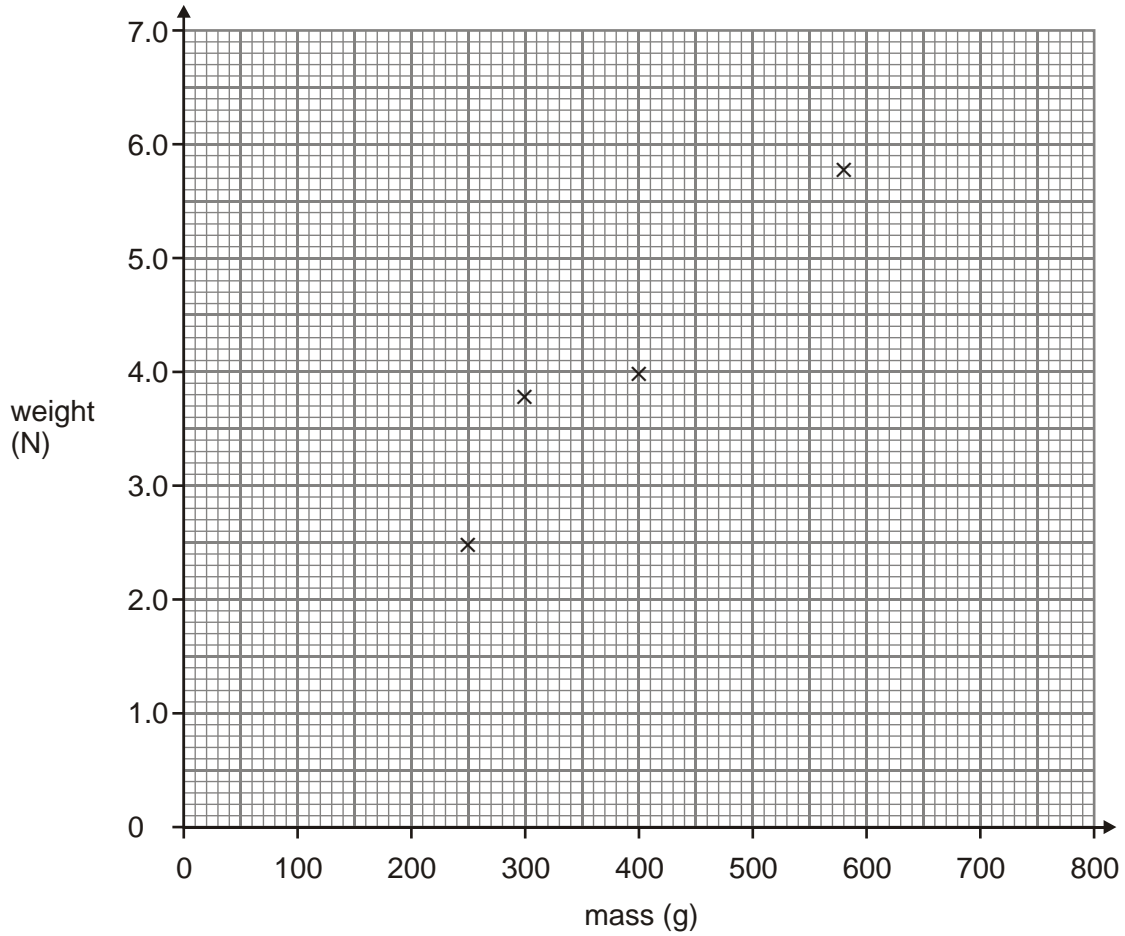| mass (g)	weight (N)
150	1.5
250	2.5
300	3.8
400	4.0
580	5.8

(a)   He plotted four of his results on a grid as shown below,

(i)   Plot the point for the 150 g mass on the graph.

1 mark

(ii) Draw a line of best fit.

1 mark

(b) One of the points Wanyonyi plotted does **not** fit the pattern.

Circle this point on the graph.

1 mark

(c) Use your graph to predict:

(i) the mass of an object weighing 6.5 N;

.... g

1 mark

(ii) the weight of an object of mass 50 g.

.... N

1 mark

(d) Give **one** reason why it is more useful to present the results as a line graph rather than a table.

....

....

1 mark

maximum 6 marks

3. You are provided with the following apparatus
·   Metre -rule
·   Two rectangular wooden blocks

By means of a suitable sketch, explain how you would use the apparatus to determine the diameter of a metal sphere.

[2m]

4. A theatre measures 100 m x 80 m x 25 m. The air inside it has a density of 1.3 kg / m³ when it is cool.

(a) Calculate the volume of the air in the theatre.

volume of air = ... m³ [1]

(b) Calculate the mass of the air. State the equation you are using.

mass of air = ... [4]

(c) Some time after the doors are opened, the heating in the theatre is switched on.
State and explain what happens to the mass of the air in the theatre as it warms up.

Statement

....

....

Explanation

....

.... [2]

(d) Suggest why the temperature of the air in the balcony of the theatre (nearer the ceiling) is likely to be greater than that lower down in the theatre.

....

.... [1]

[Total: 8]

5. An alloy is made by mixing 360 g of copper of density 9 g cm^{-3}, with 80 g of iron of density 8 gcm^{-3}. Find,
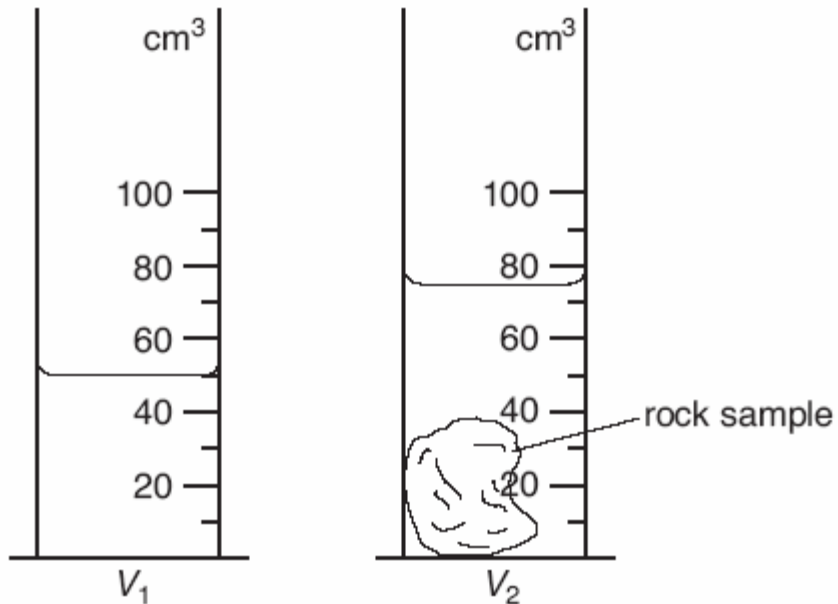
(i) The volume of copper

[1m]

(ii) The volume of iron

[1m]

(iii) The density of the alloy

[1m]

6. (a) A student is investigating the differences in density of small pieces of different rocks. She is using an electronic balance to measure the mass of each sample and using the 'displacement method' to determine the volume of each sample. Fig. 5.1 shows the displacement method.

(i) Write down the volume shown in each measuring cylinder.

V1 =...

V2 =...

(ii) Calculate the volume V of the rock sample.

V =...

(iii) Calculate the density of sample A using the equation

$$density = \frac{m}{V}.$$

Where the mass m of the sample of rock is 109 g.

Density =...

[4]

(b) The table shows the readings that the student obtains for samples of rocks B and C.

Complete the table by;
(i) Inserting the appropriate column headings with units,
(ii) Calculating the densities using the equation

$$density = \frac{m}{V}.$$

sample	m/g			V/	density/
B	193	84	50	34	
C	130	93	50	43	

[4]

(c) Explain briefly how you would determine the density of sand grains.

....

.... [1]

[Total: 9m]

7. 1.5 m³ of water is mixed with 0.50 m³ of alcohol. The density of water is 1000 kg m⁻³ and the density of alcohol is 800 kg m⁻³.
What is the density of the mixture with volume 2.0 m³?

[3m]

8.

a) You are provided with the following apparatus.
- a spring balance
- a beaker
- cork
- a sinker
- water

Using the above apparatus, describe an experiment to determine the relative density of cork.   5mks

b) A block of metal of volume $80cm^3$ weighs $3.80N$ in air. Determine it's weight when fully sub merged in a liquid of density $1200kgm^{-3}$

4mks