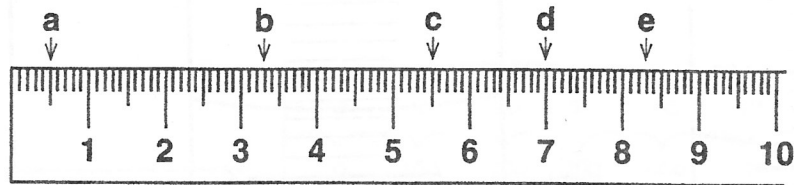


MEASURING LENGTH

Name _____

What lengths are marked on the following centimeter ruler?



cm

mm

- | | | |
|----|-------|-------|
| a) | _____ | _____ |
| b) | _____ | _____ |
| c) | _____ | _____ |
| d) | _____ | _____ |
| e) | _____ | _____ |

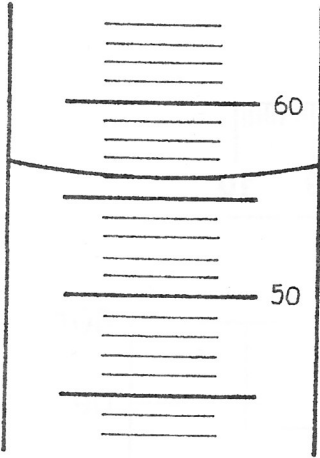
Measure the following lines with a centimeter ruler.

- | | | |
|----|-------|-------|
| f) | _____ | _____ |
| g) | _____ | _____ |
| h) | _____ | _____ |
| i) | _____ | _____ |
| j) | _____ | _____ |
| k) | _____ | _____ |
| l) | _____ | _____ |

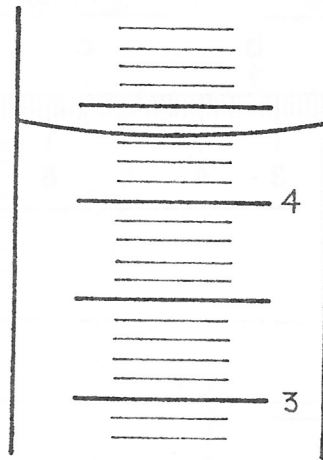
MEASURING LIQUIDS

Name _____

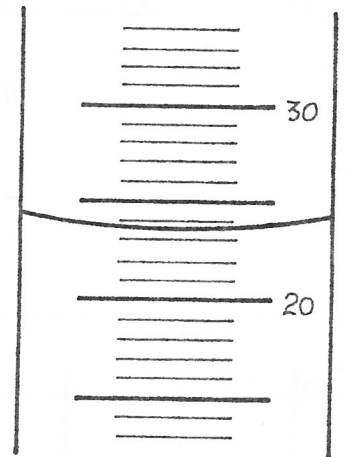
What volume is indicated on each of these graduated cylinders? The unit of volume of is mL.



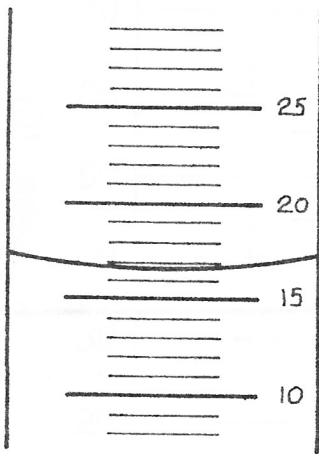
a) _____



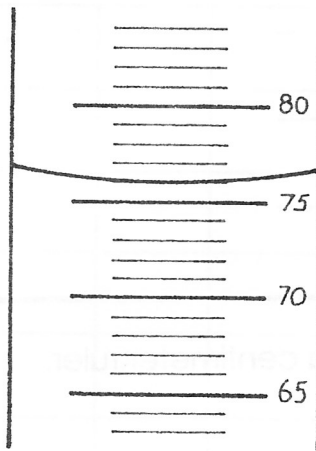
b) _____



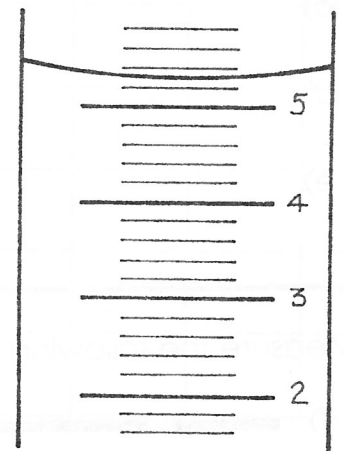
c) _____



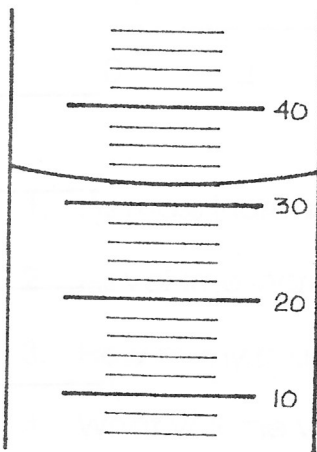
d) _____



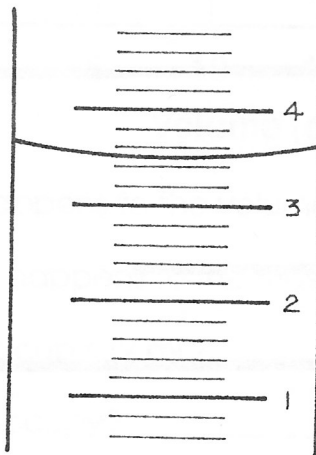
e) _____



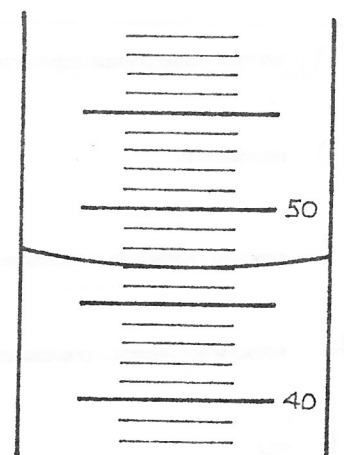
f) _____



g) _____



h) _____



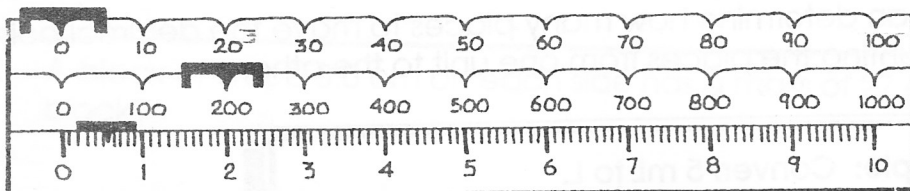
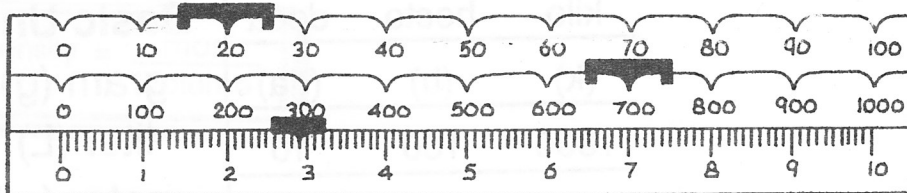
i) _____

USING THE BALANCE

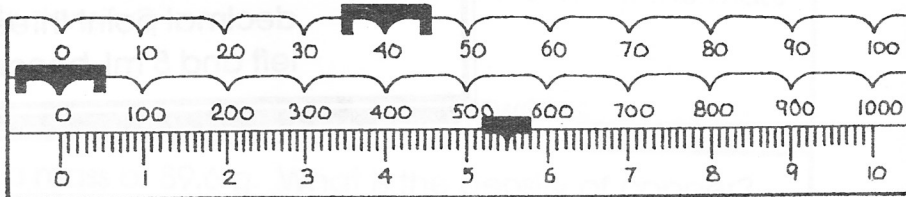
Name _____

The following balance measure mass is grams. What masses are shown on each of the following balances?

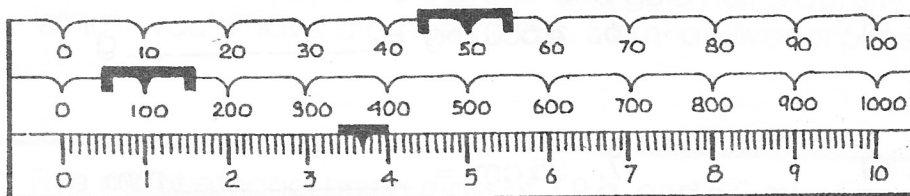
Answer: _____



Answer: _____

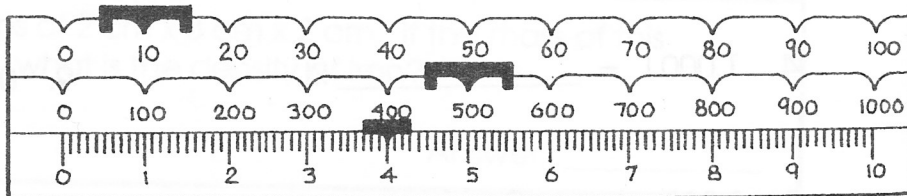


Answer: _____



Answer: _____

Answer: _____



METRICS AND MEASUREMENT

Name _____

Scientists use the metric system of measurement, based on the number 10. It is important to be able to convert from one unit to another.

| kilo | hecto | deca | Basic Unit | deci | centi | milli |
|--------|--------|--------|-------------------|-----------|-----------|-----------|
| (k) | (h) | (da) | gram (g) | (d) | (c) | (m) |
| 1000 | 100 | 10 | liter (L) | .1 | .01 | .001 |
| 10^3 | 10^2 | 10^1 | meter (m) | 10^{-1} | 10^{-2} | 10^{-3} |

Using the above chart, we can determine how many places to move the decimal point and in what direction by counting the places from one unit to the other.

Example: Convert 5 mL to L.

Answer: To go from milli (m) to the basic unit, liters, count on the above chart three places to the left. Move the decimal point three places to the left and 5 mL becomes 0.005 L.

Convert the following.

1. 35 mL = _____ dL

6. 4,500 mg = _____ g

2. 950 g = _____ kg

7. 25 cm = _____ mm

3. 275 mm = _____ cm

8. 0.005 kg = _____ dag

4. 1,000 L = _____ kL

9. 0.075 m = _____ cm

5. 1,000 mL = _____ L

10. 15 g = _____ mg

DENSITY

Name _____

Which has the greater mass, air or lead? Most of you would answer lead, but actually this question does not have an answer. To compare these two things you need to know how much of each you have. A large amount of air could have a greater mass than a small amount of lead. To compare different things, we have to compare the masses of each that occupy the same space, or volume. This is called density.

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Solve the following problems.

1. What is the density of carbon dioxide gas if 0.196 g occupies a volume of 100 mL?

Answer: _____

2. A block of wood 3.0 cm on each side has a mass of 27 g. What is the density of this block?

Answer: _____

3. An irregularly shaped stone was lowered into a graduated cylinder holding a volume of water equal to 2.0 mL. The height of the water rose to 7.0 mL. If the mass of the stone was 25 g, what was its density?

Answer: _____

4. A 10.0 cm³ sample of copper has a mass of 89.6 g. What is the density of copper?

Answer: _____

5. Silver has a density of 10.5 g/cm³ and gold has a density of 19.3 g/cm³. Which would have a greater mass, 5 cm³ of silver or 5 cm³ of gold?

Answer: _____

6. Five mL of ethanol has a mass of 3.9 g, and 5.0 mL of benzene has a mass of 4.4 g. Which liquid is denser?

Answer: _____

7. A sample of iron has the dimensions of 2 cm x 3 cm x 2 cm. If the mass of this rectangular-shaped object is 94 g, what is the density of iron?

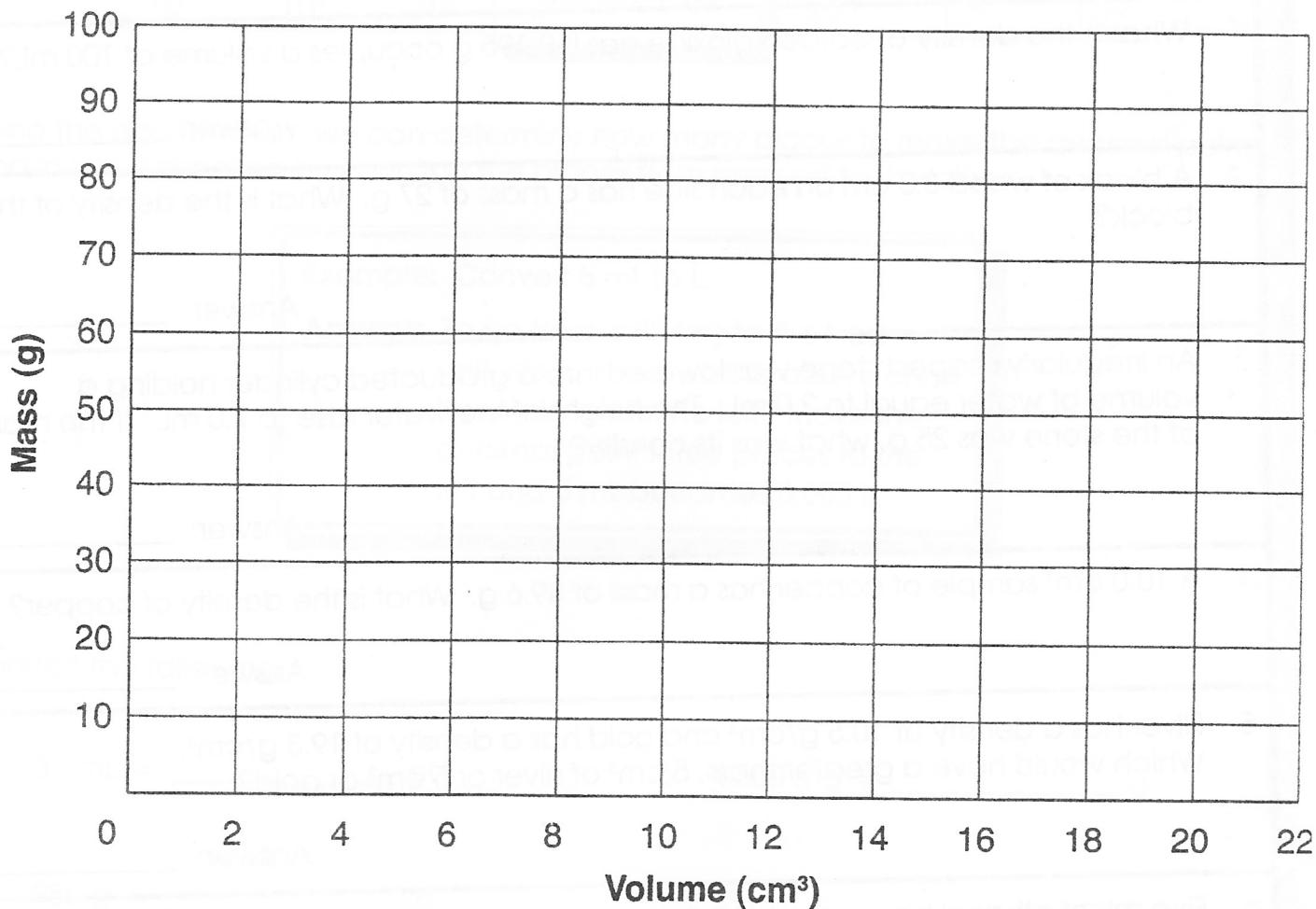
Answer: _____

GRAPHING OF DATA

Name _____

Graphing is a very important tool in science since it enables us to see trends that are not always obvious. Graph the following data and answer the questions below.

| <u>Mass of Liquid (g)</u> | <u>Volume of Liquid (cm³)</u> |
|---------------------------|--|
| 20 | 4 |
| 100 | 20 |
| 75 | 15 |
| 40 | 8 |
| 10 | 2 |



1. As mass increases, what happens to the volume? _____
2. As volume increases, what happens to the mass? _____
3. How many grams would occupy 12 mL? _____
4. What volume would 90 g occupy? _____
5. What is the density of the liquid? _____