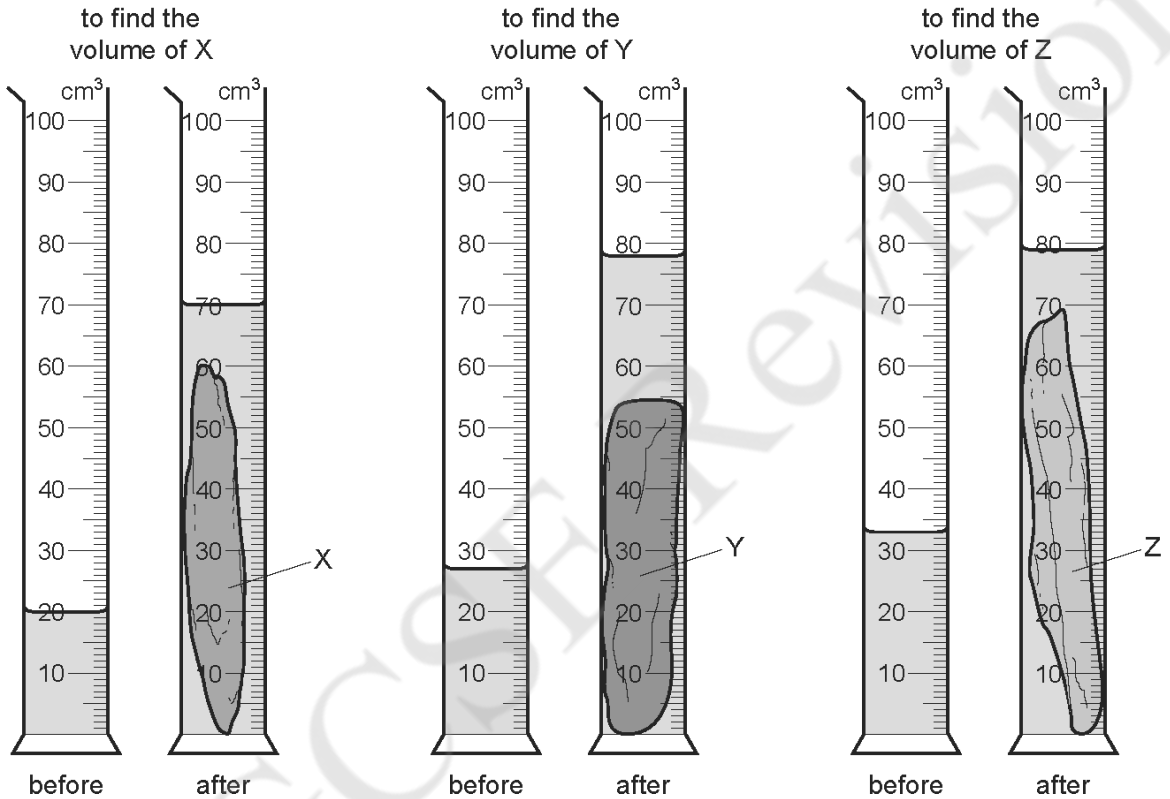# Measurement and Units - MCQ

1.

A geologist compares the volumes of three rocks, X, Y and Z. Three measuring cylinders contain different volumes of water. He places each rock into one of the measuring cylinders.

The diagrams show the measuring cylinders before and after the rocks are put in.

to find the volume of X

to find the volume of Y

to find the volume of Z

before   after   before   after   before   after

Which row shows the volumes of X, Y and Z in order, from largest to smallest?

	largest volume	→	smallest volume
A	X	Z	Y
B	Y	X	Z
C	Y	Z	X
D	Z	Y	X

2.

The diagram shows four identical spheres placed between two wooden blocks on a ruler.
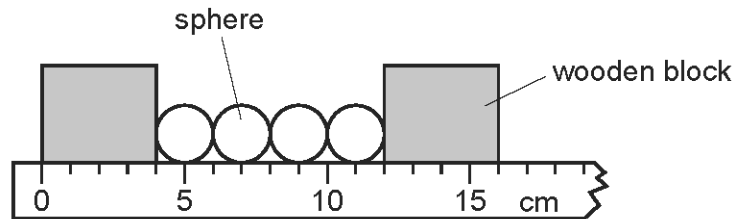
What is the diameter of one sphere?

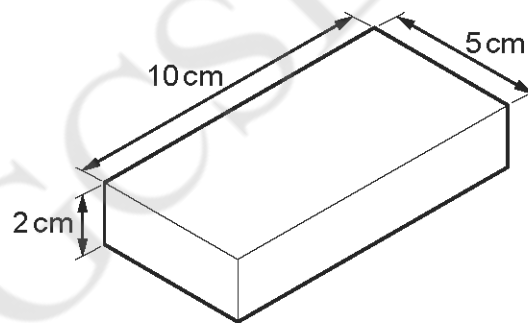**A**   1.0 cm   **B**   2.0 cm   **C**   3.0 cm   **D**   4.0 cm

3.

A cook wants to prepare some food to be cooked by 1.15 p.m. He uses an oven with an automatic timer that can be set to switch on and off at certain times. The oven needs to be switched on for 2 hours 10 minutes.

At which time does the oven need to switch on?

A   11.05 a.m.   **B**   11.25 a.m.   **C**   3.05 p.m.   **D**   3.25 p.m.

4.

A metal block has the dimensions shown. Its mass is 1000 g.

What is the density of the metal?

A $\left(\dfrac{5 \times 10}{1000 \times 2} \right)$ g/cm^3

B $\left(\dfrac{2 \times 5 \times 10}{1000} \right)$ g/cm^3

C $\left(\dfrac{1000 \times 2}{5 \times 10} \right)$ g/cm^3

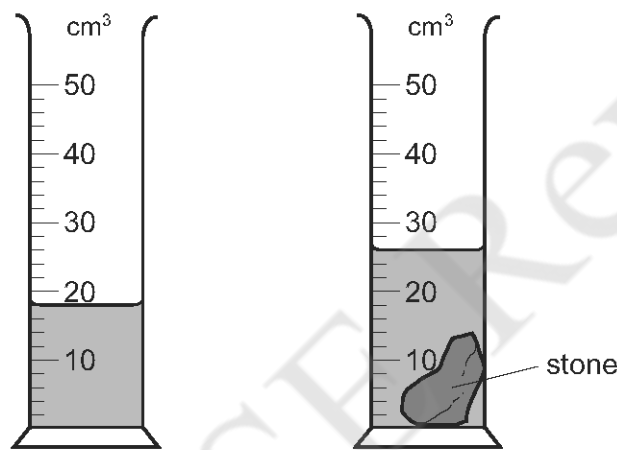**D** $\left(\dfrac{1000}{2 \times 5 \times 10} \right)$ g/cm^3

5.

Which option contains **only** apparatus that could be used to determine the volume of a small block of unknown material?

A measuring cylinder, metre rule

B measuring cylinder, stopwatch

C metre rule, balance

D metre rule, stopwatch

6.

The diagram shows a measuring cylinder used to measure the volume of a small stone.

What is the volume of the stone?

A 8 cm^3 **B** 9 cm^3 **C** 14 cm^3 **D** 26 cm^3

7.

A student uses a measuring cylinder to measure the volume of a quantity of water.

Which action would make her result **less** accurate?

A making sure her eye is level with the water surface

B making sure the cylinder is vertical

C reading the bottom of the meniscus

D using the largest measuring cylinder possible

8.

A student wishes to determine the density of the solid block shown.
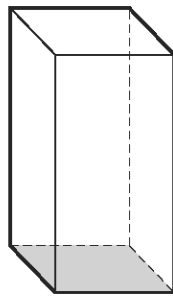
Which quantities must be known?

A   the area of the shaded face and the volume of the block

B   the area of the shaded face and the weight of the block

C   the mass of the block and the height of the block

D   the mass of the block and the volume of the block

9.

Two cylinders are made of the same metal. Both cylinders have the same cross-sectional area but one is longer than the other.
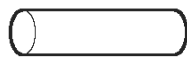
cylinder 1   cylinder 2

Which quantity is the same for both cylinders?

A   density

B   mass

C   resistance

D   volume

10.

The mass of a piece of metal is 1200 g.
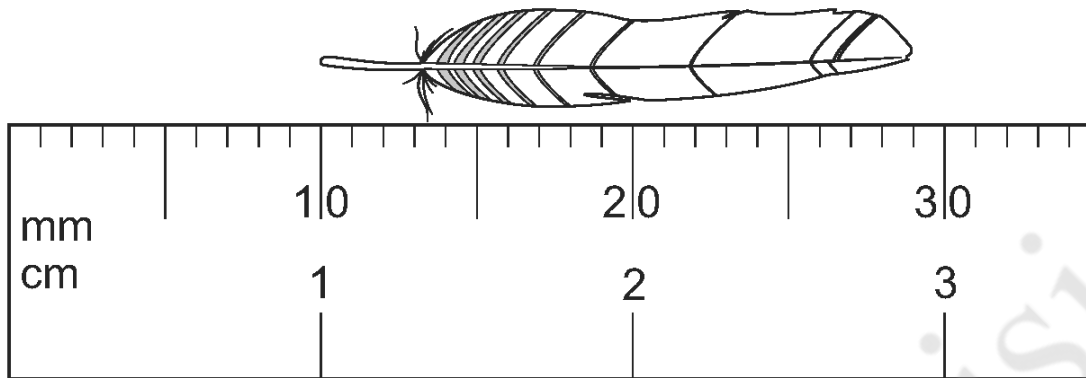
A measuring cylinder contains 150 cm^3 of water.

The piece of metal is put into the measuring cylinder. The water level rises to 250 cm^3 and covers the metal.

What is the density of the metal?

A   3.0 g/cm^3 **B**   4.8 g/cm^3 **C**   8.0 g/cm^3 **D**   12.0 g/cm^3

11.

The diagram shows an enlarged drawing of the end of a metre rule. It is being used to measure the length of a small feather.
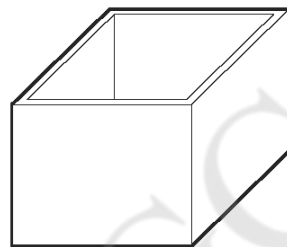

What is the length of the feather?

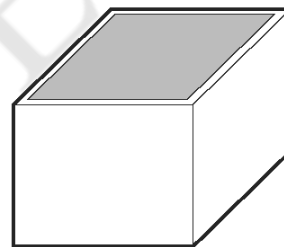**A**   19 mm   **B**   29 mm   **C**   19 cm   **D**   29 cm

12.

The diagrams show an empty rectangular box, and the same box filled with liquid.

The box has a mass of 60 g when empty. When filled with liquid, the total mass of the box and the liquid is 300 g.
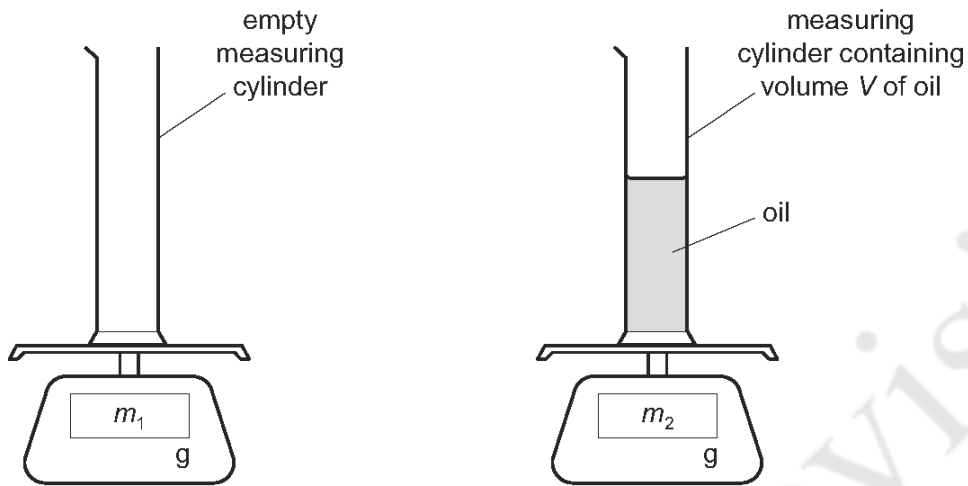

empty box
60 g

box filled with liquid
300 g

The density of the liquid is 1.2 g/cm^3.

What is the volume of the liquid in the box?

A   50 cm^3 **B**   200 cm^3 **C**   250 cm^3 **D**   300 cm^3

13.

A student uses a measuring cylinder and a balance to find the density of oil. The diagram shows the arrangement used.

empty measuring cylinder

measuring cylinder containing volume V of oil

oil

m_1 g

m_2 g

Which calculation gives the density of the oil?

A $\dfrac{V}{m_2}$ B $\dfrac{V}{(m_2 - m_1)}$ C $\dfrac{m_2}{V}$ D $\dfrac{(m_2 - m_1)}{V}$

14.

The diagrams show an empty container, and the same container filled with liquid.

The empty container has a mass of 120 g. When filled with the liquid, the total mass of the container and the liquid is 600 g.

empty container
120 g

container filled with liquid
600 g

The volume of liquid in the container is 600 cm³.

What is the density of the liquid?

A   0.020 g/cm³   B   0.80 g/cm³   C   1.0 g/cm³   D   1.2 g/cm³

15.

What is the most accurate and precise method to measure the thickness of a coin?

A   Use a micrometer screw gauge.

B   Use a ruler and look at the scale perpendicularly.

C   Use a top pan balance.

D   Use the displacement method with water in a measuring cylinder.

16.

A pendulum is swinging. Five students each measure the time it takes to swing through ten complete swings.

Three students measure the time as 17.2 s. Another student measures it as 16.9 s, and the fifth student measures it as 17.0 s.
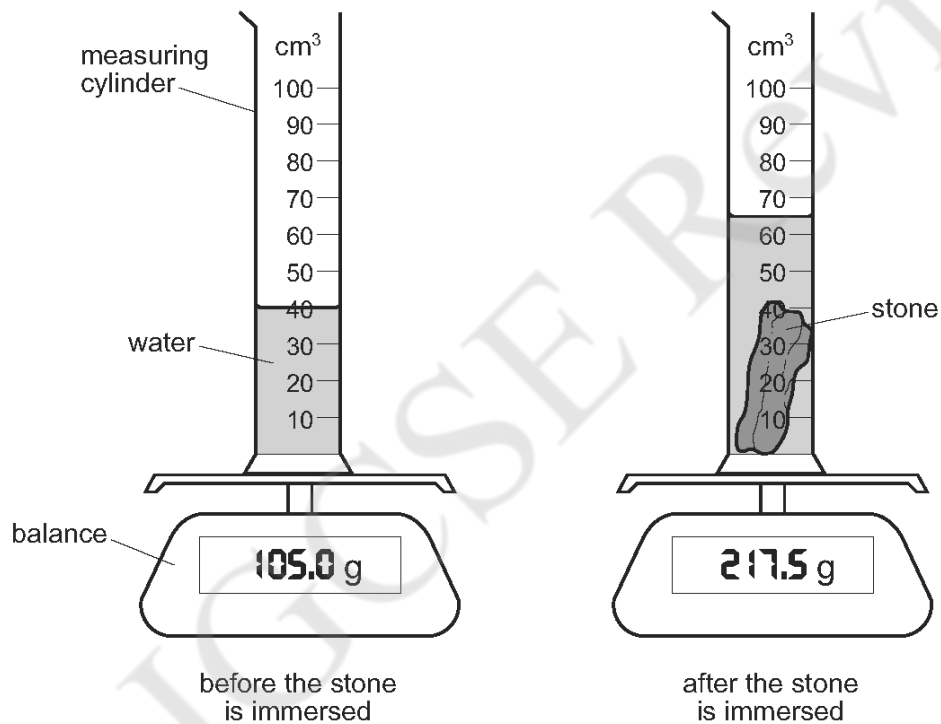
What is the average period of the pendulum?

A   1.69 s   **B**   1.70 s   **C**   1.71 s   **D**   1.72 s

17.

A measuring cylinder containing only water is placed on an electronic balance. A small, irregularly shaped stone is now completely immersed in the water.

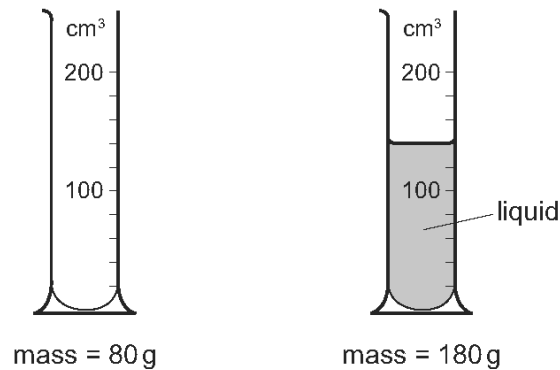The diagrams show the equipment before and after the stone is immersed.

before the stone   after the stone
is immersed   is immersed

What is the density of the material of the stone?

A   1.7 g / cm³   **B**   3.3 g / cm³   **C**   4.5 g / cm³   **D**   8.7 g / cm³

18.

The masses of a measuring cylinder before and after pouring some liquid into it are shown in the diagram.

mass = 80 g   mass = 180 g

What is the density of the liquid?

A $\dfrac{100}{120}$ g/cm^3 B $\dfrac{100}{140}$ g/cm^3 C $\dfrac{180}{120}$ g/cm^3 D $\dfrac{180}{140}$ g/cm^3

19.

A steel ball bearing has a mass of 24 g and a density of 8.0 g/cm^3. It is lowered into a measuring cylinder containing 12 cm^3 of water.

What is the new water level in the cylinder?

A   3.0 cm^3 B   4.0 cm^3 C   15 cm^3 D   16 cm^3

20.

A student measures the volume of a cork.

He puts some water into a measuring cylinder and then one glass ball. He puts the cork and then a second, identical glass ball into the water as shown.

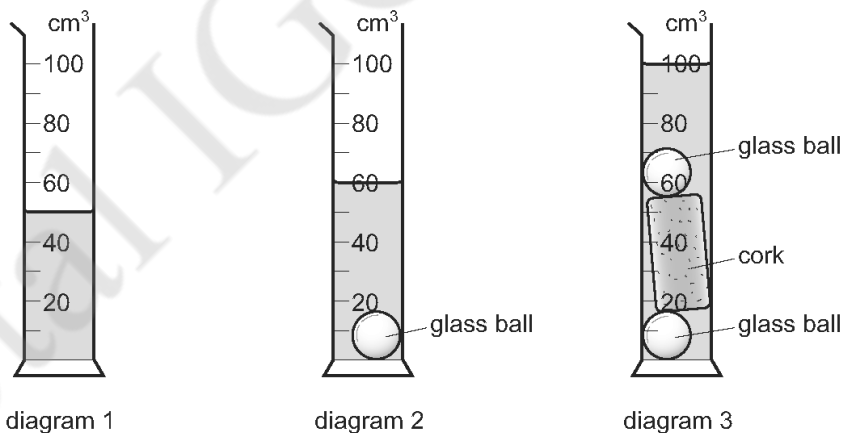diagram 1   diagram 2   diagram 3

Diagram 1 shows the first water level.

Diagram 2 shows the water level after one glass ball is added.

Diagram 3 shows the water level after the cork and the second glass ball are added.

What is the volume of the cork?

A   30 cm^3 B   40 cm^3 C   50 cm^3 D   100 cm^3

21.

A student investigates the rate of flow of oil through a funnel.

The diagrams show the experiment and the volume of oil in the measuring cylinder at the start of the experiment, and one minute later.

initial
measurement

after 1.0
minute
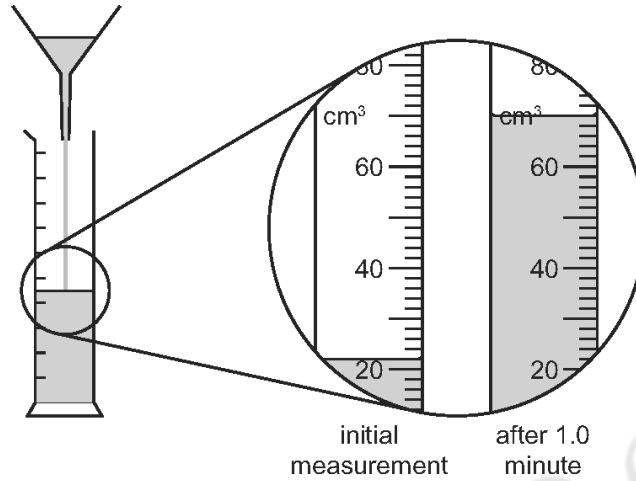
What is the rate of flow of oil through the funnel during the one minute?

A   0.73 cm³/s   B   0.80 cm³/s   C   44 cm³/s   D   48 cm³/s

22.

A measuring cylinder contains some water. A small metal block is slowly lowered into the water and is then removed.

Finally a piece of plastic is attached to the metal block and the block is again slowly lowered into the water.

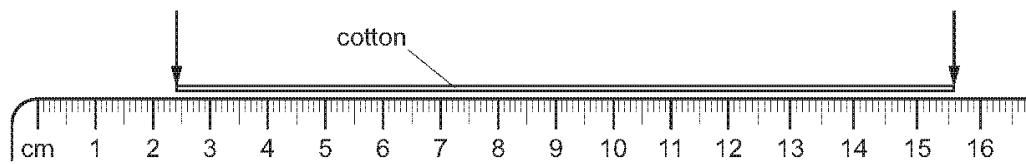The diagrams show the measuring cylinder at each stage of this process.
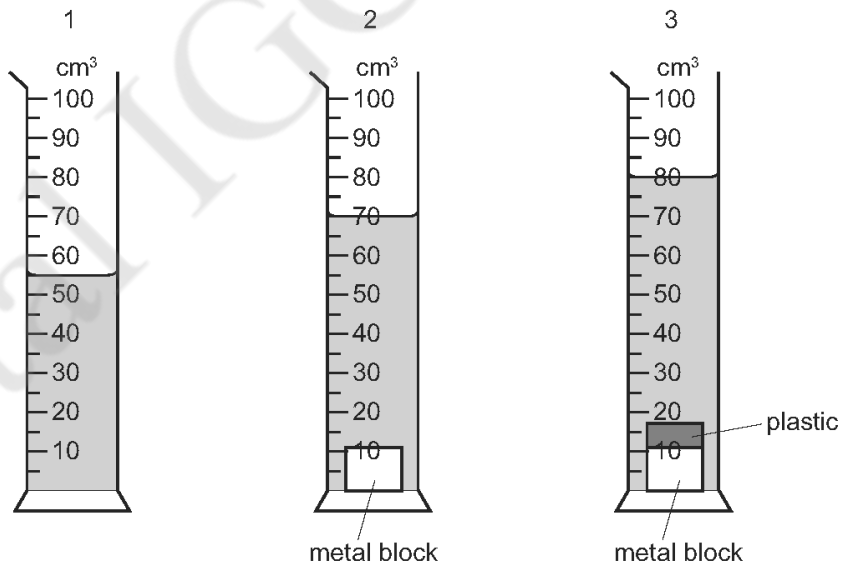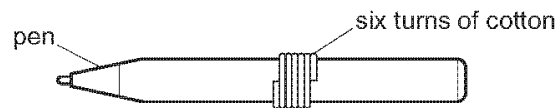

What is the volume of the piece of plastic?

A   10 cm³   B   25 cm³   C   70 cm³   D   80 cm³

23.

A length of cotton is measured between two points on a ruler.

When the length of cotton is wound closely around a pen, it goes round six times.

What is the distance once round the pen?

A 2.2 cm   **B** 2.6 cm   **C** 13.2 cm   **D** 15.6 cm

24.

An oil tank has a base of area $2.5 \, m^2$ and is filled with oil to a depth of 1.2 m.
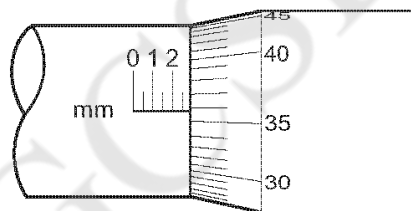
The density of the oil is $800 \, kg/m^3$.

What is the force exerted on the base of the tank due to the oil?

A 960 N   **B** 2400 N   **C** 9600 N   **D** 24 000 N

25.

The diagram shows part of a micrometer screw gauge.

What is the smallest reading that can be achieved using this micrometer screw gauge?

A 0.0001 mm   **B** 0.01 mm   **C** 0.1 mm   **D** 1 mm
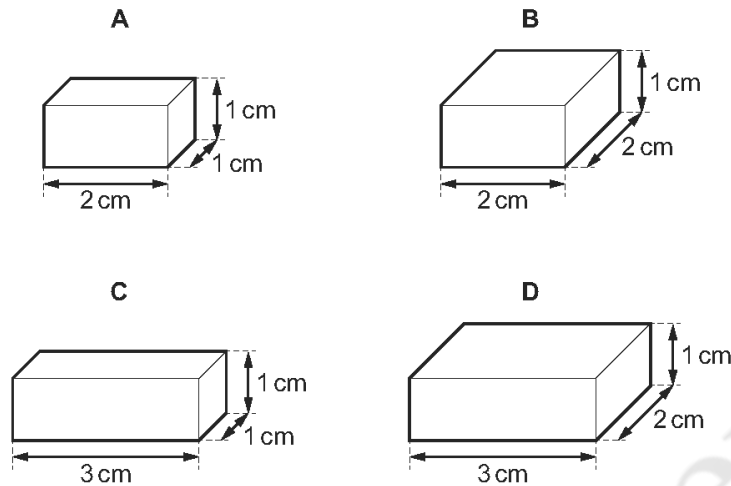
26.

A liquid has a volume of $0.040 \, m^3$ and a mass of 30 000 g.

What is the density of the liquid?

A $0.075 \, kg/m^3$ **B** $7.5 \, kg/m^3$ **C** $750 \, kg/m^3$ **D** $7500 \, kg/m^3$

27.

The diagram shows four blocks of different metals. Each block has a mass of 12 g.

Which metal has the largest density?

A

1 cm
1 cm
2 cm

B

1 cm
2 cm
2 cm

C

1 cm
1 cm
3 cm

D

1 cm
2 cm
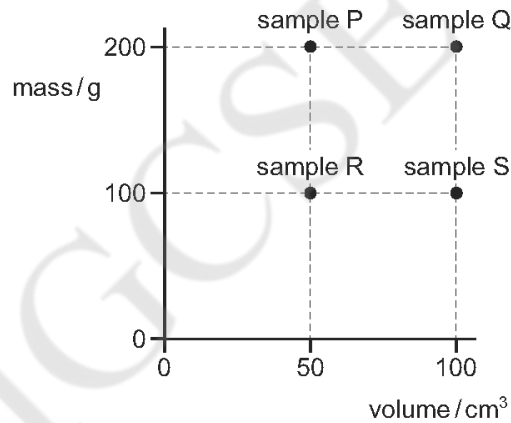3 cm

28.

A student carries out experiments to find the mass and the volume of four samples of rock.

The graph shows the results.

sample P   sample Q

200 —

mass / g

sample R   sample S

100 —

0

0   50   100

volume / cm³

Which pair are samples of the same type of rock?

A P and Q   **B** P and S   **C** R and Q   **D** Q and S
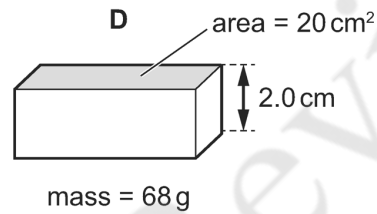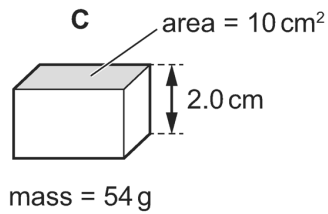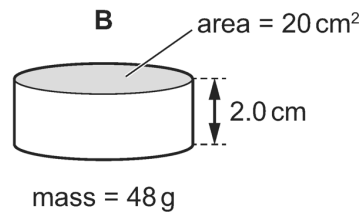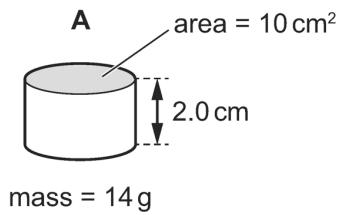
29.

Which quantity can be measured directly using a micrometer screw gauge?

A   the area of a sheet of paper

B   the mass of a sheet of paper

C   the thickness of a sheet of paper

D   the volume of a sheet of paper

30.

The diagrams show four solid blocks with their dimensions and masses.

Which block has the greatest density?

A area = 10 cm²
2.0 cm
mass = 14 g

B area = 20 cm²
2.0 cm
mass = 48 g

C area = 10 cm²
2.0 cm
mass = 54 g

D area = 20 cm²
2.0 cm
mass = 68 g

31.

A metal has a density of $8.0 \, g/cm^3$. A solid cube of mass 1.0 kg is made from this metal.

How long is each side of the cube?

A 0.50 cm   **B** 2.0 cm   **C** 5.0 cm   **D** 42 cm

32.

X, Y and Z are three regularly shaped solid objects.

Their dimensions and masses are shown in the diagrams.

object X
2 cm
10 cm   5 cm
200 g
electronic
balance

object Y
3 cm
6 cm   4 cm
200 g

object Z
1 cm
1 cm
25 cm
50 g
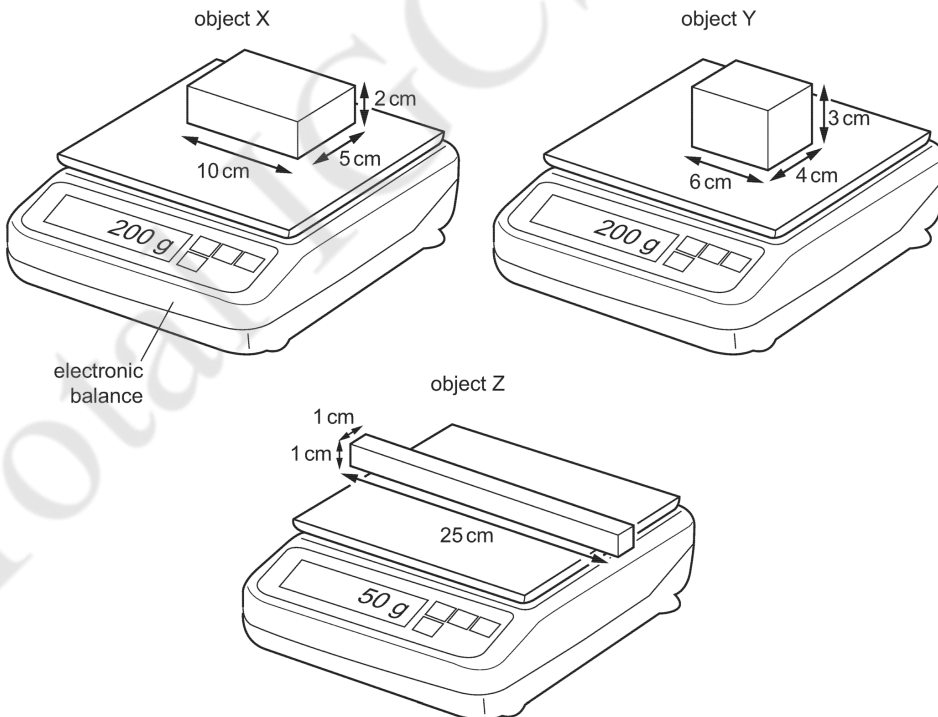
Which objects have the same density?

A X, Y and Z   **B** X and Y only   **C** X and Z only   **D** Y and Z only

33.

A student measures the diameter of a pencil.

Which measuring instrument will give the most precise reading?

A   a measuring tape

B   a metre rule

C   a micrometer screw gauge

D   a ruler

34.

A student measures the dimensions of a cylindrical glass beaker.

For which measurement should she use a micrometer screw gauge?

A   circumference of the beaker

B   diameter of the beaker

C   height of the beaker

D   thickness of the glass wall of the beaker

35.

Which is the best apparatus to use to measure the thickness of a coin?

A   balance

B   ruler with a millimetre scale

C   micrometer screw gauge

D   pressure gauge

36.

The density of air is $1.2 \, \text{kg} / \text{m}^3$.

A room has dimensions $5.0 \, \text{m} \times 4.0 \, \text{m} \times 3.0 \, \text{m}$.

What is the mass of the air in the room?

A   0.02 kg   **B**   0.10 kg   **C**   50 kg   **D**   72 kg

37.

The table gives the mass and the volume of three objects P, Q and R.

object	mass / g	volume / cm^3
P	23	36
Q	170	720
R	240	340

Which objects can float in a liquid of density $0.85 \, \text{g} / \text{cm}^3$?

A   P and Q only

B   P and R only

C   Q and R only

D   P, Q and R

38.

Four hollow glass spheres P, Q, R and S each have a mass of 72 g.

Their volumes are given in the table.

	volume / cm^3
P	55
Q	65
R	75
S	85

Which spheres sink in a liquid of density 0.9 g / cm^3?

A   P, Q and R   **B**   Q, R and S   **C**   R and S only   **D**   S only