01. 0625_w12_qp_13 Q: 5

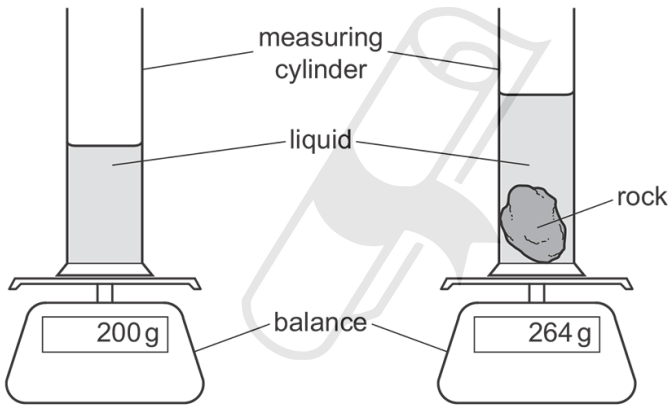
Which row identifies quantities that are measured in newtons?

	electromotive force (e.m.f.)	mass	weight
A	no	no	yes
B	no	yes	yes
C	yes	no	no
D	yes	yes	no

1.4 Density

02. 0625_m22_qp_22 Q: 5

A student carries out an experiment to find the density of a rock.



Which two measurements does the student need to make to determine the density of the rock?

	measurement 1	measurement 2
A	increase in mass	increase in volume of liquid
B	final mass	increase in depth of liquid
C	increase in mass	increase in depth of liquid
D	final mass	increase in volume of liquid

---

03. 0625_m21_qp_22 Q: 5

A small bottle has a mass of 20 g when empty. The volume of the bottle is 10 cm^3.

When full of liquid, the total mass is 150 g.

What is the density of the liquid?

A 0.50 g/cm^3 **B** 2.0 g/cm^3 **C** 13 g/cm^3 **D** 15 g/cm^3

---

04. 0625_s21_qp_21 Q: 5

The mass of an empty flask is 34 g.

The volume of liquid added to the flask is 20 cm^3.

The total mass of the flask and the liquid is 50 g.

What is the density of the liquid?

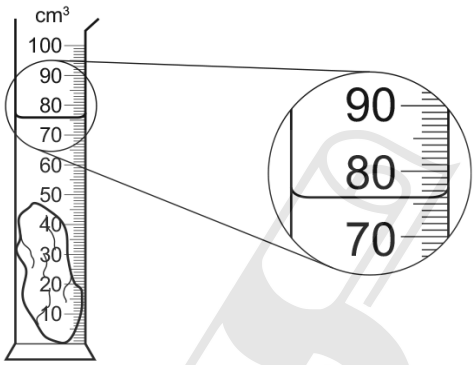
A 0.80 g/cm^3 **B** 1.25 g/cm^3 **C** 2.50 g/cm^3 **D** 4.20 g/cm^3

---

05. 0625_s21_qp_22 Q: 5

A measuring cylinder contains 40 cm^3 of water.

A stone of mass 94 g is lowered into the water so that it is fully submerged as shown.



What is the density of the stone?

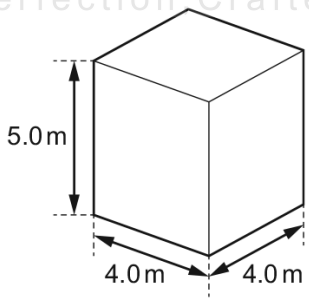
A 1.1 g/cm^3 **B** 1.2 g/cm^3 **C** 2.1 g/cm^3 **D** 2.6 g/cm^3

---

06. 0625_s21_qp_23 Q: 5

The tank shown has the dimensions 5.0 m × 4.0 m × 4.0 m.

It is completely filled with water of density 1000 kg/m^3.



What is the mass of water in the tank?

A 12.5 kg **B** 62.5 kg **C** 16 000 kg **D** 80 000 kg

---

07. 0625_w21_qp_21 Q: 4

Which substance in the table has the lowest density?

	substance	mass / g	volume / cm^3
A	nylon	1.2	1.0
B	cotton	1.5	1.0
C	olive oil	1.8	2.0
D	water	2.0	2.0

---

08. 0625_m20_qp_22 Q: 6

A measuring cylinder contains 40 cm^3 of water.

A solid metal ball is dropped into the water and the water level rises to 56 cm^3.

The mass of the ball is 80 g.

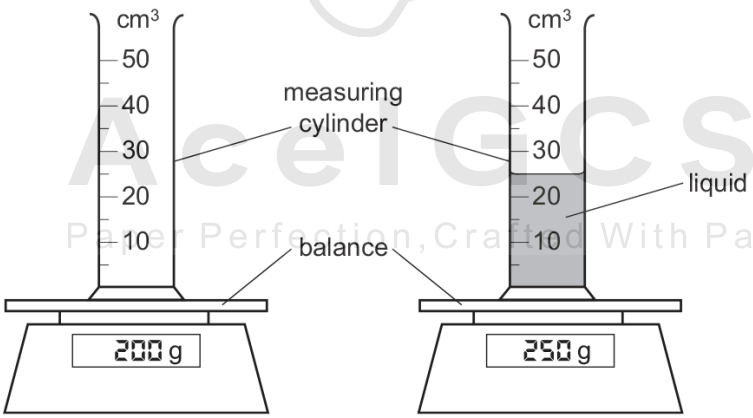
What is the density of the metal from which the ball is made?

A 0.20 g / cm^3 **B** 1.4 g / cm^3 **C** 2.0 g / cm^3 **D** 5.0 g / cm^3

---

09. 0625_p20_qp_20 Q: 5

The diagram shows an experiment to find the density of a liquid.



What is the density of the liquid?

A 0.5 g / cm^3 **B** 2.0 g / cm^3 **C** 8.0 g / cm^3 **D** 10.0 g / cm^3

---

10. 0625_s20_qp_21 Q: 6

The mass of a measuring cylinder is 190 g.

400 cm^3 of liquid is put into the measuring cylinder.

The total mass of the measuring cylinder and the liquid is 560 g.

Four solid objects are lowered in turn into the liquid. The densities of the objects are shown.

1 0.40 g/cm^3

2 0.90 g/cm^3

3 1.2 g/cm^3

4 2.7 g/cm^3

Which objects will float in the liquid?

A 1 only **B** 1 and 2 only **C** 1, 2 and 3 **D** 3 and 4 only

---

11. 0625_s20_qp_22 Q: 6

Water has a density of 1000 kg/m^3.

A rectangular swimming pool has an average depth of 1.6 m.

The length of the pool is 25 m.

The width of the pool is 10 m.

What is the mass of the water in the swimming pool?

A 2.5 kg **B** 400 kg **C** 400 000 kg **D** 800 000 kg

---

12. 0625_s20_qp_23 Q: 6

A rectangular gymnasium is 50 m long, 25 m wide and 8.0 m high.

The density of air is 1.2 kg/m^3.

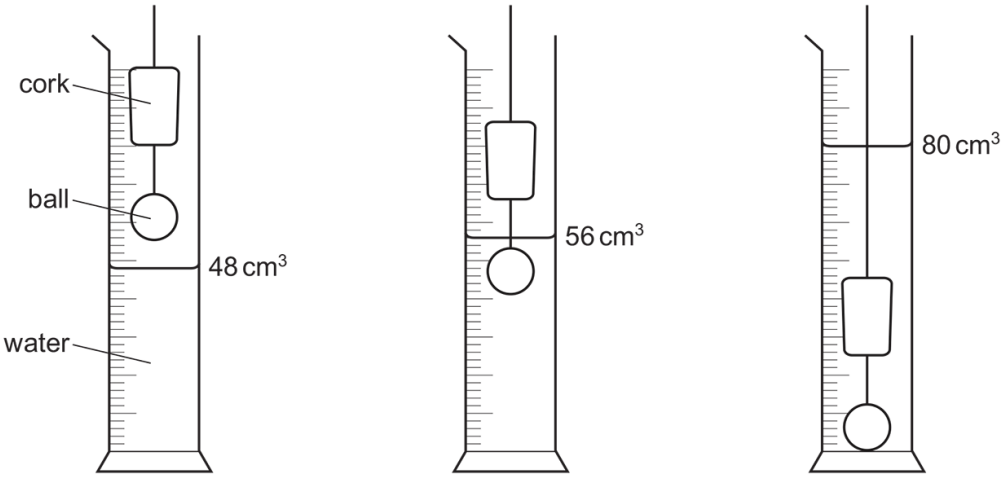
What is the best estimate of the mass of air in the gymnasium?

A 0.00012 kg **B** 100 kg **C** 8300 kg **D** 12 000 kg

---

13. 0625_w20_qp_21 Q: 6

A metal ball is attached to a cork and is lowered into a measuring cylinder, pulling the cork into the water, as shown.



ball and cork above the water

ball fully submerged but cork above the water

both ball and cork fully submerged

The mass of the cork is 4.8 g.

What is the density of the cork?

A 0.15 g / cm^3 **B** 0.20 g / cm^3 **C** 0.60 g / cm^3 **D** 5.0 g / cm^3

---

14. 0625_w20_qp_22 Q: 6

A rectangular metal block is 20 cm long.

The cross-sectional area of the block is 25 cm^2.

The mass of the block is 4000 g.

What is the density of the metal?

A 0.13 g / cm^3 **B** 0.32 g / cm^3 **C** 8.0 g / cm^3 **D** 2000 g / cm^3

---

15. 0625_w20_qp_23 Q: 6

A square wooden raft floats on a lake. The density of the water in the lake is 1000 kg / m°.

The sides of the raft are 2.0 m long and the thickness of the raft is 0.20 m.

The mass of the raft is 700 kg.

How many barrels, each of mass 100 kg, could be placed on the raft before its surface sinks to the surface of the water?

A 1 **B** 7 **C** 8 **D** 15

---

16. 0625_m19_qp_22 Q: 6

A solid ball has a volume of 4.0 cm^3. The density of the ball is 1.6 g / cm^3.

What is the mass of the ball?

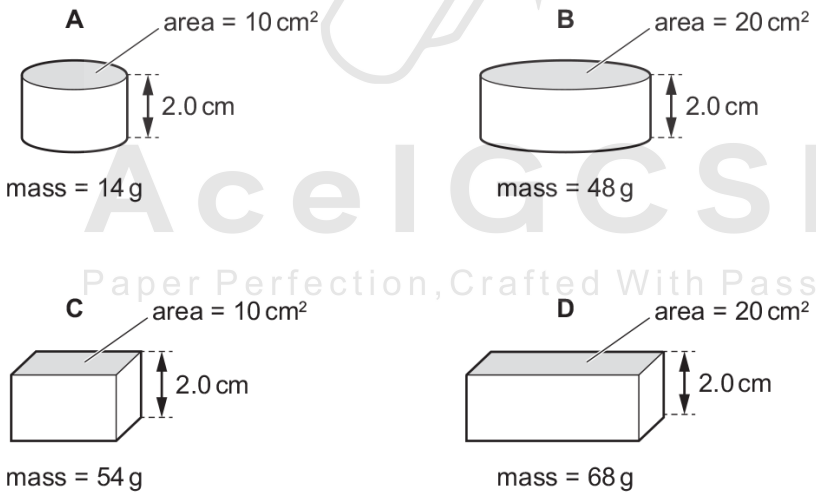
A 0.4 g **B** 2.5 g **C** 4.0 g **D** 6.4 g

---

17. 0625_s19_qp_21 Q: 5

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

Which block has the greatest density?



---

18. 0625_s19_qp_22 Q: 5

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?

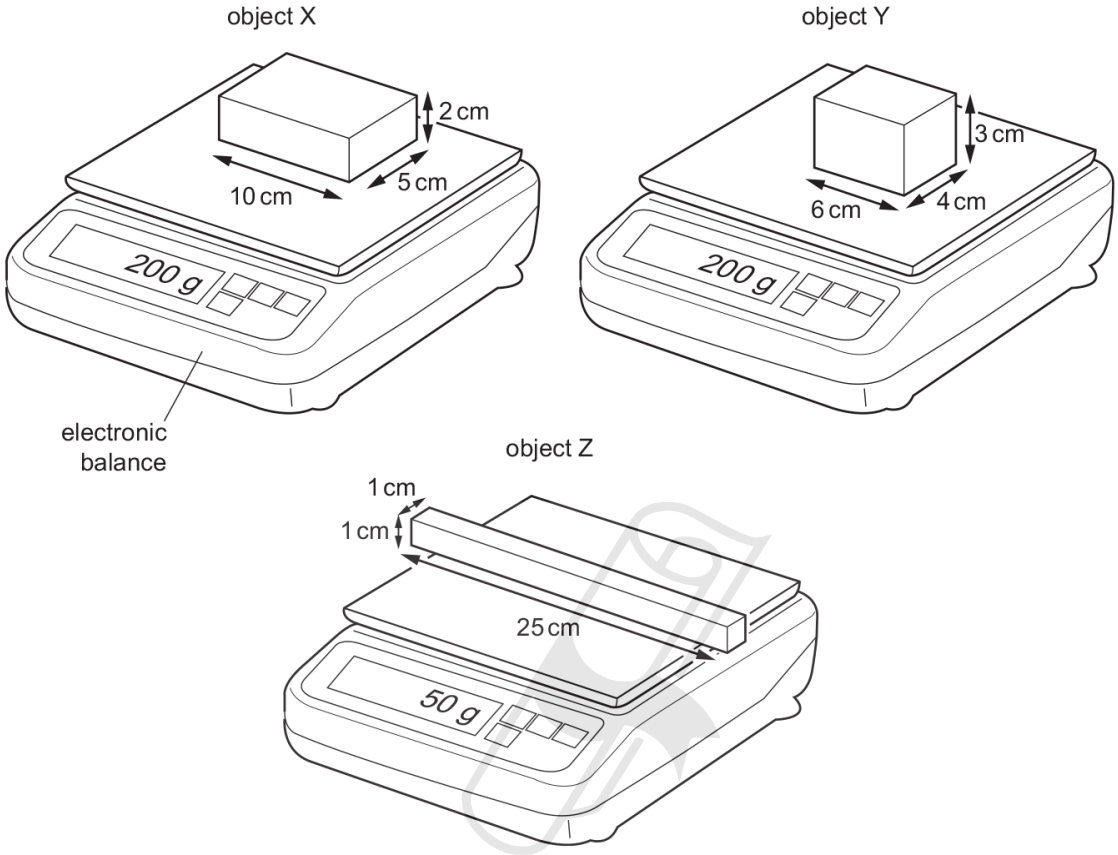
A 0.50 cm **B** 2.0 cm **C** 5.0 cm **D** 42 cm

---

19. 0625_s19_qp_23 Q: 5

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

Their dimensions and masses are shown in the diagrams.



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

---

20. 0625_w19_qp_21 Q: 5

The density of air is 1.2 kg / m^3.

A room has dimensions 5.0 m × 4.0 m × 3.0 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

---

21. 0625_w19_qp_22 Q: 5

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 g / cm^3?

A P and Q only

B P and R only

C Q and R only

D P, Q and R

---

22. 0625_w19_qp_22 Q: 6

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

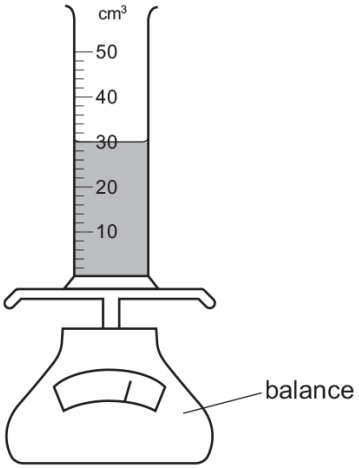
Which spheres sink in a liquid of density 0.9 g / cm^3?

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

---

23. 0625_m18_qp_22 Q: 6

A measuring cylinder contains 30 cm^3 of a liquid.



Some more of the liquid is added until the liquid level reaches the 50 cm^3 mark.

The reading on the balance increases by 30 g.

What is the density of the liquid?

A 0.60 g/cm^3 **B** 0.67 g/cm^3 **C** 1.5 g/cm^3 **D** 1.7 g/cm^3

---

24. 0625_w18_qp_21 Q: 5

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

What is the density of the liquid?

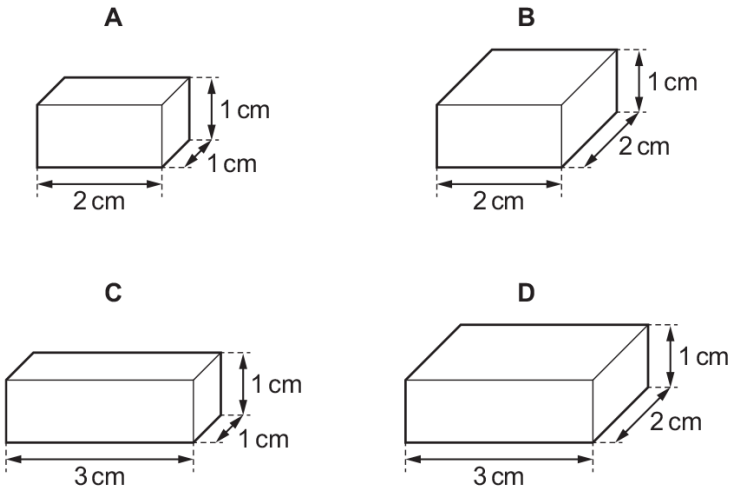
A 0.075 kg/m^3 **B** 7.5 kg/m^3 **C** 750 kg/m^3 **D** 7500 kg/m^3

---

25. 0625_w18_qp_22 Q: 5

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

Which metal has the largest density?

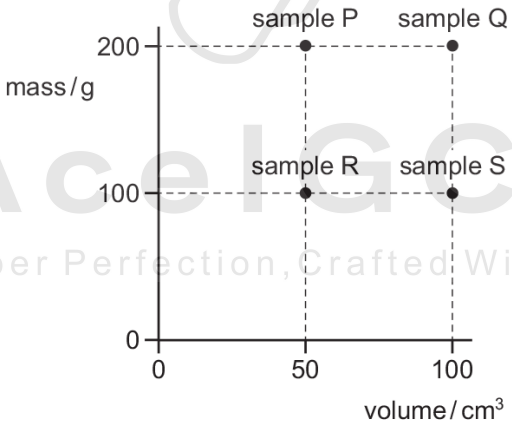


---

26. 0625_w18_qp_23 Q: 5

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

The graph shows the results.



Which pair are samples of the same type of rock?

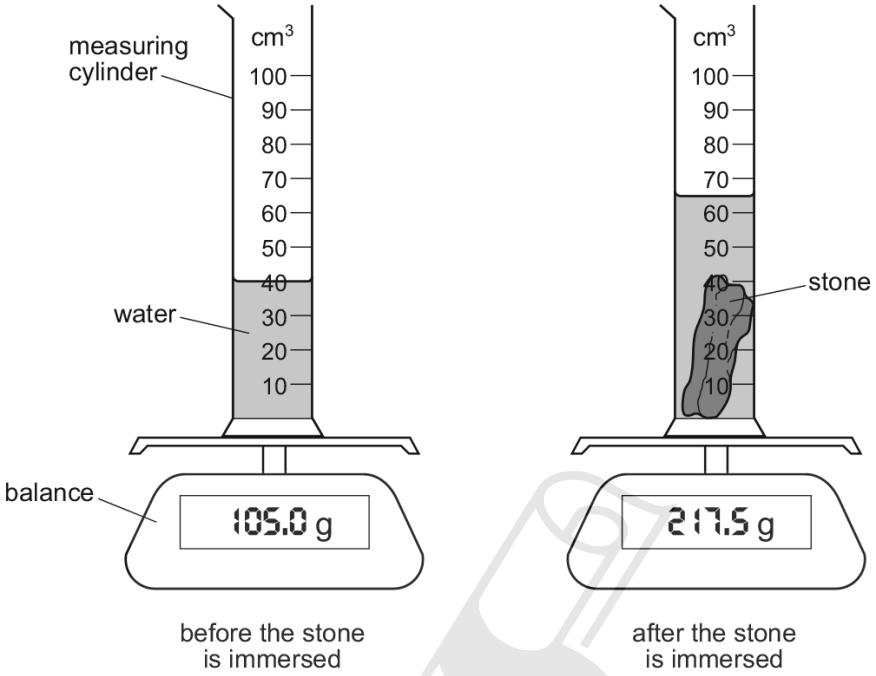
A P and Q **B** P and S **C** R and Q **D** Q and S

---

27. 0625_s17_qp_21 Q: 5

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.

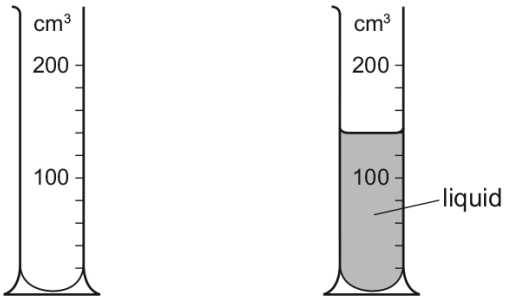


What is the density of the material of the stone?

A $1.7\,g/cm^3$ **B** $3.3\,g/cm^3$ **C** $4.5\,g/cm^3$ **D** $8.7\,g/cm^3$

28. 0625_s17_qp_22 Q: 5

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 $\frac{100}{120}$ g / cm³ **B** $\frac{100}{140}$ g / cm³ **C** $\frac{180}{120}$ g / cm³ **D** $\frac{180}{140}$ g / cm³

---

29. 0625_s17_qp_23 Q: 5

A steel ball bearing has a mass of 24 g and a density of 8.0 g / cm³. It is lowered into a measuring cylinder containing 12 cm³ of water.

What is the new water level in the cylinder?

A 3.0 cm³ **B** 4.0 cm³ **C** 15 cm³ **D** 16 cm³

---

30. 0625_w17_qp_21 Q: 1

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.

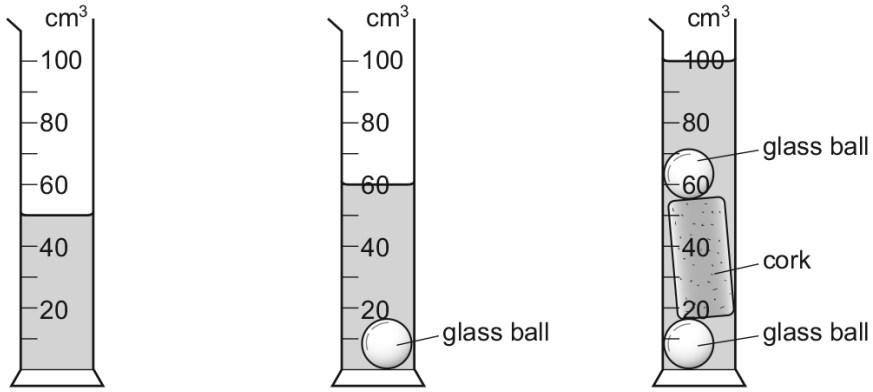


diagram 1 diagram 2 diagram 3

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?

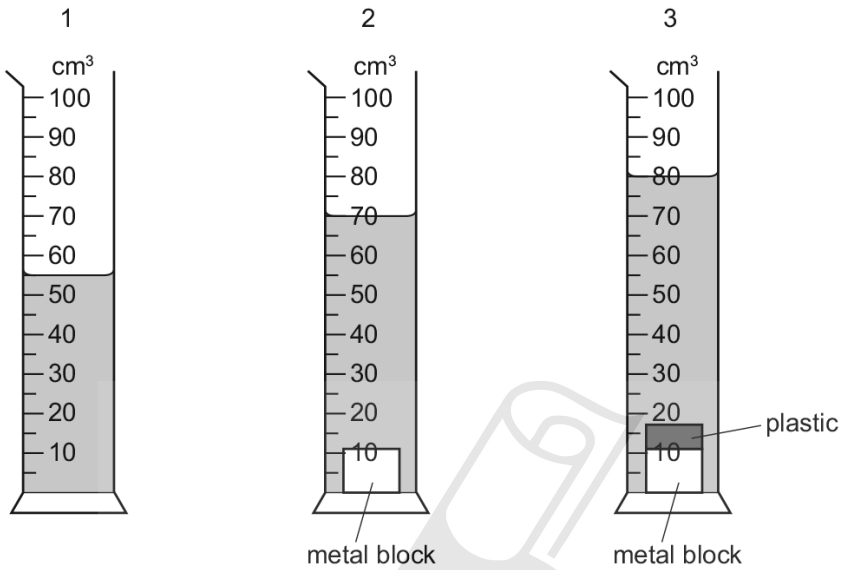
A 30 cm^3 **B** 40 cm^3 **C** 50 cm^3 **D** 100 cm^3

31. 0625_w17_qp_23 Q: 1

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.



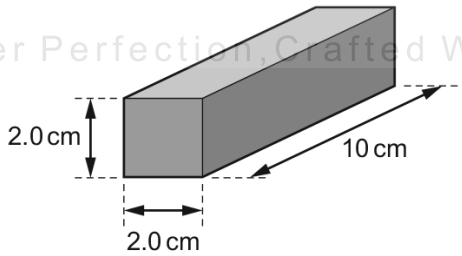
What is the volume of the piece of plastic?

A 10 cm^3 **B** 25 cm^3 **C** 70 cm^3 **D** 80 cm^3

---

32. 0625_m16_qp_22 Q: 5

The diagram shows a cuboid block made from a metal of density 2.5 g / cm^3.



What is the mass of the block?

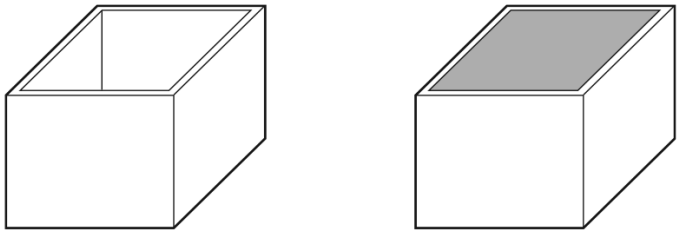
A 8.0 g **B** 16 g **C** 50 g **D** 100 g

---

33. 0625_w16_qp_21 Q: 5

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

---

34. 0625_w16_qp_23 Q: 5

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 cm^3.

What is the density of the liquid?

A 0.020 g / cm^3 **B** 0.80 g / cm^3 **C** 1.0 g / cm^3 **D** 1.2 g / cm^3

---

35. 0625_m15_qp_12 Q: 5

A person measures the length, width, height and mass of a metal block with rectangular sides.

Which of these measurements must be used in order to calculate the density of the metal?

A mass only

B height and mass only

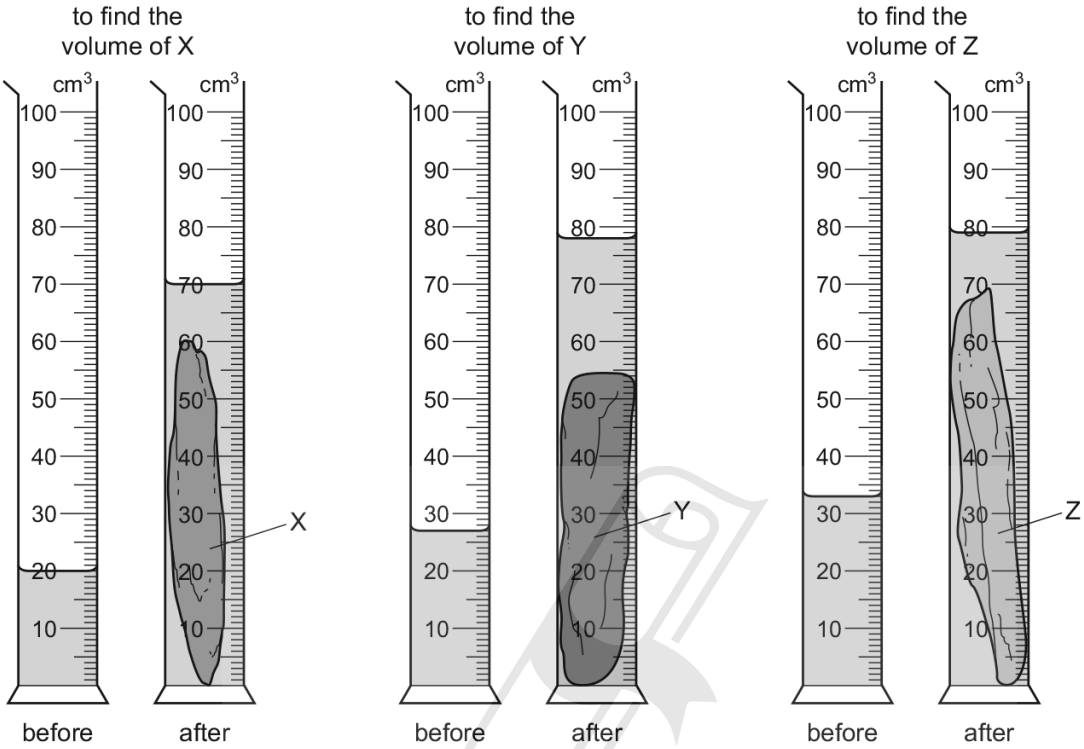
C length, width and height only

D length, width, height and mass

36. 0625_s15_qp_11 Q: 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.

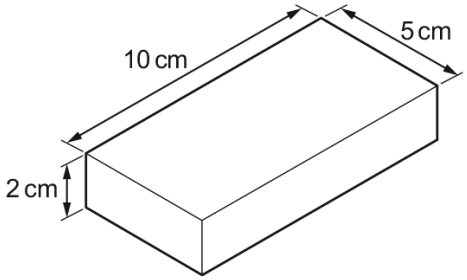


Which row shows the volumes of X, Y and Z in order, from largest to smallest?

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

37. 0625_s15_qp_11 Q: 5

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



What is the density of the metal?

A $\left(\frac{5\times10}{1000\times2}\right)$ g/cm^3

B $\left(\frac{2\times5\times10}{1000}\right)$ g/cm^3

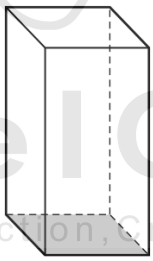
C $\left(\frac{1000\times2}{5\times10}\right)$ g/cm^3

D $\left(\frac{1000}{2\times5\times10}\right)$ g/cm^3

---

38. 0625_w15_qp_11 Q: 5

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

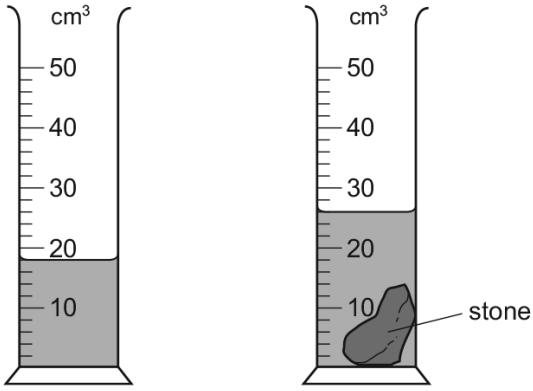
C the mass of the block and the height of the block

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

---

39. 0625_w15_qp_12 Q: 1

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



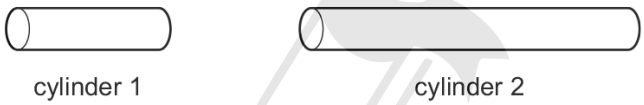
What is the volume of the stone?

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

---

40. 0625_w15_qp_12 Q: 5

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



Which quantity is the same for both cylinders?

A density

B mass

C resistance

D volume

---

41. 0625_w15_qp_13 Q: 5

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

---

42. 0625_s14_qp_11 Q: 5

A liquid has a volume of 100 cm^3 and a mass of 85 g.

The density of water is 1.0 g / cm^3.

How does the density of the liquid compare with the density of water?

A Its density is higher than that of water.

B Its density is lower than that of water.

C Its density is the same as that of water.

D It is impossible to say with only this data.

---

43. 0625_s14_qp_12 Q: 5

The table gives the volumes and masses of four objects.

Which object has the greatest density?

	mass / g	volume / cm^3
A	5.4	2.0
B	13	3.0
C	15	6.0
D	18	5.0

---

44. 0625_w14_qp_11 Q: 1

Diagram 1 shows a measuring cylinder containing water.

Five identical steel balls are now lowered into the measuring cylinder. Diagram 2 shows the new water level in the cylinder.

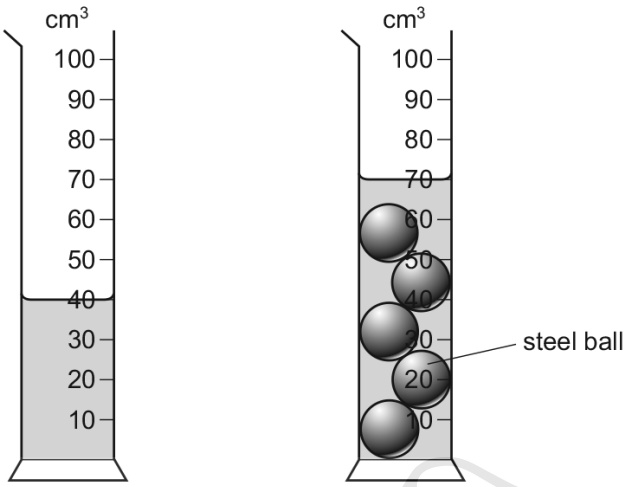


diagram 1 diagram 2

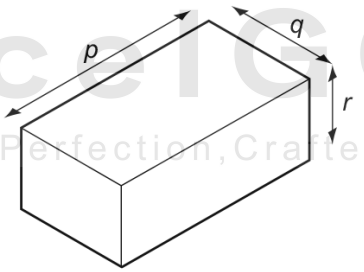
What is the volume of each steel ball?

A 6 cm^3 **B** 14 cm^3 **C** 30 cm^3 **D** 70 cm^3

---

45. 0625_w14_qp_11 Q: 6

The diagram shows the dimensions of a rectangular block of metal of mass *m*.



Which expression is used to calculate the density of the metal?

A $m \times p \times q$

B $m \times p \times q \times r$

C $\frac{m}{(p \times q)}$

D $\frac{m}{(p \times q \times r)}$

---

46. 0625_w14_qp_13 Q: 6

Diagram 1 shows an empty measuring cylinder on a balance.

Diagram 2 shows the same measuring cylinder on the balance, but it now contains a liquid.

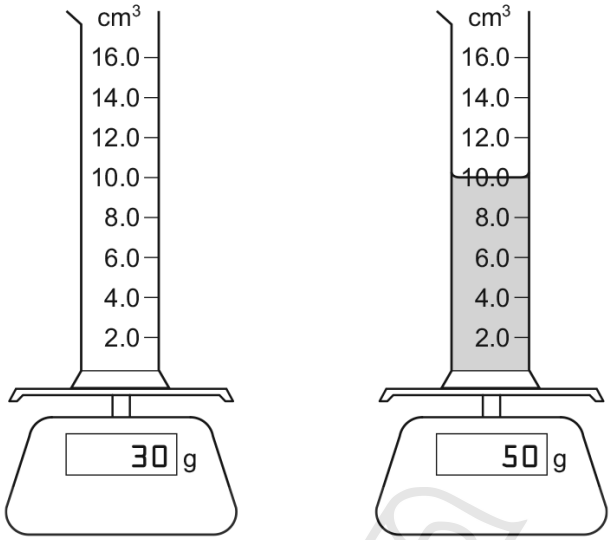


diagram 1 diagram 2

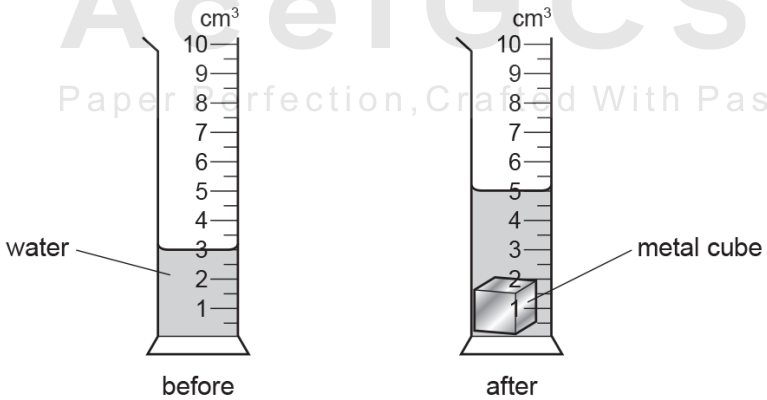
What is the density of the liquid?

A $0.2\,g/cm^3$ **B** $0.5\,g/cm^3$ **C** $2.0\,g/cm^3$ **D** $5.0\,g/cm^3$

---

47. 0625_s13_qp_11 Q: 1

The diagrams show the readings on a measuring cylinder before and after a small metal cube is added.



before after

How many more identical cubes can be added to the cylinder, without causing the water to overflow? Do not include the cube already in the cylinder.

A 1 **B** 2 **C** 3 **D** 4

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48. 0625_s13_qp_11 Q: 6

A measuring cylinder has a mass of 120 g when empty.

When it contains 50 cm^3 of a liquid, the total mass of the measuring cylinder and the liquid is 160 g.

What is the density of the liquid?

A $\frac{40}{50}$ g/cm^3

B $\frac{50}{40}$ g/cm^3

C $\frac{120}{50}$ g/cm^3

D $\frac{160}{50}$ g/cm^3

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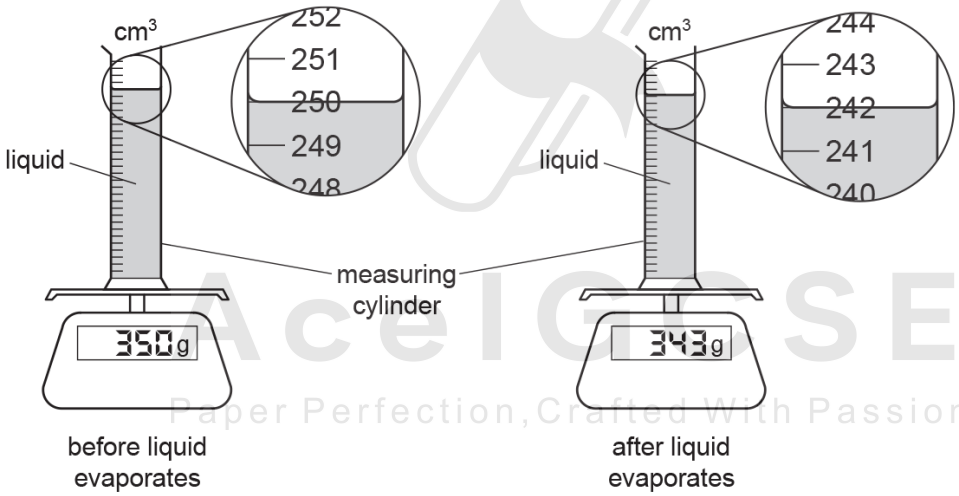
49. 0625_s13_qp_12 Q: 6

A measuring cylinder containing liquid is placed on a top-pan balance. The apparatus is left overnight and some of the liquid evaporates. The diagrams show the readings.



What is the density of the liquid?

A 0.875 g/cm^3 **B** 1.14 g/cm^3 **C** 1.40 g/cm^3 **D** 1.42 g/cm^3

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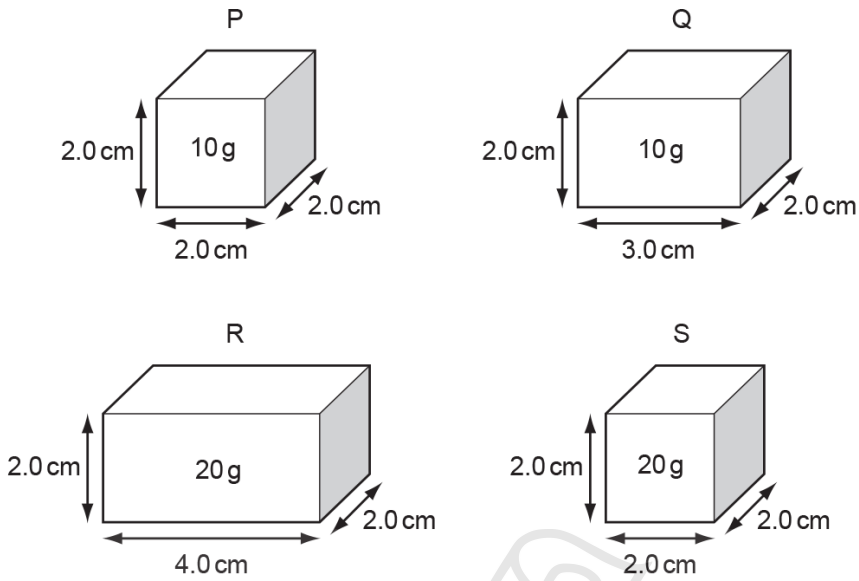
50. 0625_w13_qp_11 Q: 6

Four rectangular blocks, P, Q, R and S are shown. Each block is labelled with its size and its mass.



Which two blocks have the same density?

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

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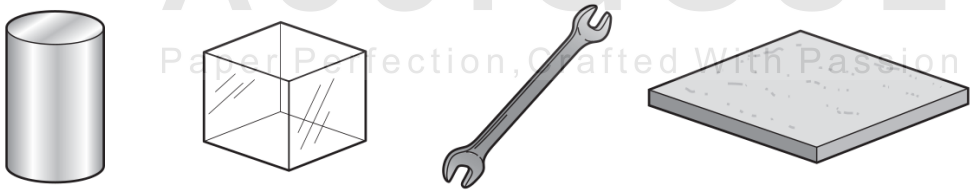
51. 0625_w13_qp_13 Q: 6

A student is given four different objects and a metre rule.
Each object has a known mass. She is asked to determine the densities of the materials from which the four objects are made.

The objects are a copper cylinder, a glass cube, a steel spanner and a stone tile.



copper glass steel stone

Using only the metre rule, she is able to find the densities of only three of the four materials.

Which three materials are these?

A copper, glass and steel

B copper, glass and stone

C copper, steel and stone

D glass, steel and stone

SN	Paper	Q. No.	Answer
01	0625_w12_qp_13	5	A
02	0625_m22_qp_22	5	A
03	0625_m21_qp_22	5	C
04	0625_s21_qp_21	5	A
05	0625_s21_qp_22	5	D
06	0625_s21_qp_23	5	D
07	0625_w21_qp_21	4	C
08	0625_m20_qp_22	6	D
09	0625_p20_qp_20	5	B
10	0625_s20_qp_21	6	B
11	0625_s20_qp_22	6	C
12	0625_s20_qp_23	6	D
13	0625_w20_qp_21	6	B
14	0625_w20_qp_22	6	C
15	0625_w20_qp_23	6	A
16	0625_m19_qp_22	6	D
17	0625_s19_qp_21	5	B
18	0625_s19_qp_22	5	C
19	0625_s19_qp_23	5	C
20	0625_w19_qp_21	5	D
21	0625_w19_qp_22	5	D
22	0625_w19_qp_23	6	A
23	0625_m18_qp_22	6	C
24	0625_w18_qp_21	5	C
25	0625_w18_qp_22	5	A
26	0625_w18_qp_23	5	C
27	0625_s17_qp_21	5	C
28	0625_s17_qp_22	5	B
29	0625_s17_qp_23	5	C
30	0625_w17_qp_21	1	A
31	0625_w17_qp_23	1	A
32	0625_m16_qp_22	5	D
33	0625_w16_qp_21	5	B
34	0625_w16_qp_23	5	B
35	0625_m15_qp_12	5	D
36	0625_s15_qp_11	1	B
37	0625_s15_qp_11	5	D
38	0625_w15_qp_11	5	D
39	0625_w15_qp_12	1	A
40	0625_w15_qp_12	5	A
41	0625_w15_qp_13	5	D
42	0625_s14_qp_11	5	B
43	0625_s14_qp_12	5	B
44	0625_w14_qp_11	1	A
45	0625_w14_qp_11	6	D
46	0625_w14_qp_13	6	C
47	0625_s13_qp_11	1	B
48	0625_s13_qp_11	6	A
49	0625_s13_qp_12	6	A

SN	Paper	Q. No.	Answer
50	0625_w13_qp_11	6	B
51	0625_w13_qp_13	6	B