DENSITY

[ESTIMATED TIME: 75 minutes]

GCSE

(+ IGCSE) EXAM QUESTION PRACTICE

1. **[2 marks]**

The mass of 4 m^3 of copper is 35 800 kg.
Calculate the density of the copper.

..... kg/m^3

(2)

2. **[2 marks]**

The density of steel is 8050 kg/m^3.
Work out the mass of 5 m^3 of steel.

..... kg

(2)

3. **[2 marks]**

A gold chain has a volume of 4 cm^3.
The density of gold is 19.3 grams per cm^3.
Calculate the mass of the gold chain.

..... g

(2)

4. **[2 marks]**

The mass of a standard gold bar is 1000 grams.
The density of gold is 19.3 grams per cm^3.
Work out the volume of a standard gold bar.

..... cm^3

(2)

5. **[3 marks]**

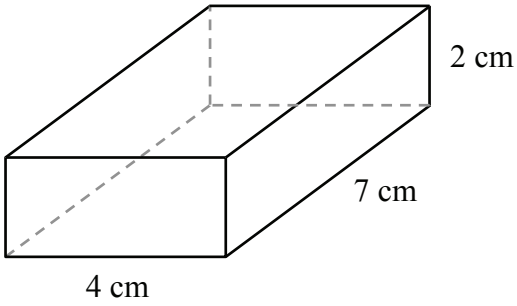


Diagram **NOT** accurately drawn

The diagram shows a solid wooden block in the shape of a cuboid.
The block is made from wood with density 0.58 g/cm^3
Work out the mass of the block.

..... g

(3)

6. **[2 marks]**

The density of concrete is 2.4 g/cm^3.
Work out the mass of a concrete slab which has a volume of 12 m^3.
Give your answer in kilograms.

..... kg

(2)

7. **[3 marks]**

The diagram shows a solid triangular prism.

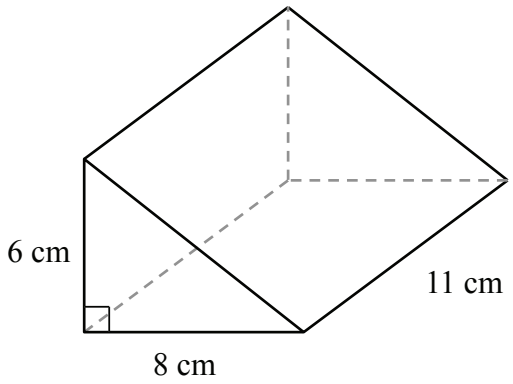


Diagram **NOT** accurately drawn

The prism is made from steel.
The density of the steel is 7.9 grams per cm^3.
Calculate the mass of the prism.
Give your answer in kilograms, correct to 3 significant figures.

.....

(3)

8. **[4 marks]**

The diagram shows a solid rubber ball in the shape of a sphere.

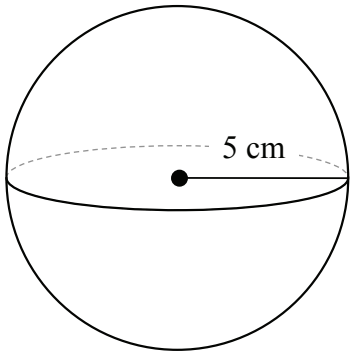


Diagram **NOT** accurately drawn

The radius of the ball is 5 cm.
The mass of the ball is 550 grams.
An object will only float in water if its density is less than 1.0 g/cm^3.
Will this rubber ball float in water?
You must show clear calculations to justify your answer.

.....

(4)

9. **[5 marks]**

The diagram shows a steel girder in the shape of a prism.

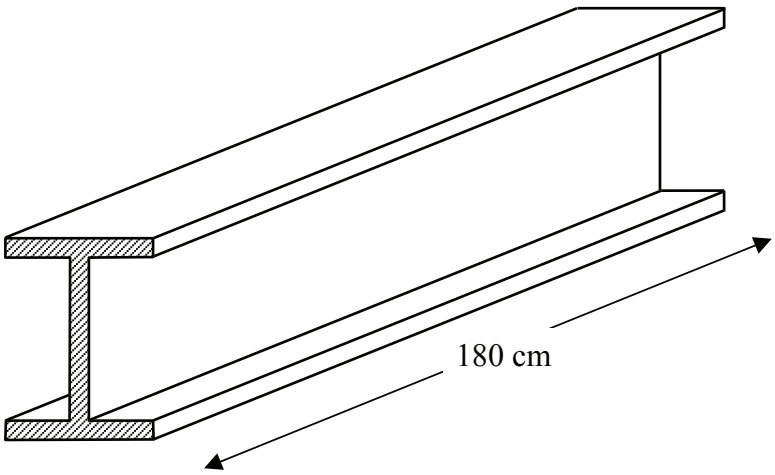


Diagram **NOT** accurately drawn

The length of the girder is 180 cm.

The cross sectional area of the girder is 18 cm^2.

The steel has a density 7.8 g/cm^3.

Justin has a pickup truck.

The maximum load that Justin's truck can carry is 500 kg.

Find the maximum number of these steel girders that Justin can carry in his truck, without exceeding the maximum load.

.....

(5)

10. **[4 marks]**

. 200g of aluminium and 200g of copper are mixed to make 400g of an alloy.
Aluminium has a density of 2.7 g/cm^3.
Copper has a density of 8.9 g/cm^3.
Work out the density of the alloy.

..... g/cm^3

(4)

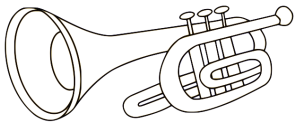
11. **[4 marks]**

. Liquid A has a density of 0.7 g/cm^3.
Liquid B has a density of 1.6 g/cm^3.
140 g of liquid A and 128 g of liquid B are mixed to make liquid C.
Work out the density of liquid C.

..... g/cm^3

(4)

12. **[4 marks]**



Brass is an alloy which is made by mixing copper and zinc.
Copper has a density of 8.9 g/cm^3.
Zinc has a density of 7.1 g/cm^3.
1 kilogram of brass is made by mixing 630 g of copper with 370 g of zinc.
Work out the density of the brass.
Give your answer correct to 1 decimal place.

..... g/cm^3

(4)

13. **[4 marks]**

One sheet of A4 paper has dimensions 21.0 cm by 29.7 cm.
The paper has a mass of 80 g per m^2.
Work out the total mass of 500 sheets of A4 paper.
Give your answer in kilograms, correct to 3 significant figures.

.....

(4)

14. **[4 marks]**

. Mia makes an orange drink by mixing orange concentrate with water.
She mixes 15 ml of orange concentrate with 200 ml of water.
The density of the orange concentrate is 1.24 g/cm^3.
The density of water is 1.00 g/cm^3.
Work out the density of Mia's drink.
Give your answer correct to 2 decimal places.

..... g/cm^3

(3)

15. **[4 marks]**

The density of apple juice is 1.05 grams per cm^3.
The density of fruit syrup is 1.4 grams per cm^3.
The density of carbonated water is 0.99 grams per cm^3.
25 cm^3 of apple juice are mixed with 15 cm^3 of fruit syrup and 280 cm^3 of carbonated water to make a drink with a volume of 320 cm^3.
Work out the density of the drink.
Give your answer correct to 2 decimal places.

..... g/cm^3

(4)

16. **[5 marks]**

The densities of two different liquids *A* and *B* are in the ratio 11 : 9
The mass of 1 ml of liquid *B* is 1.2 g.
10 ml of liquid *A* is mixed with 20 ml of liquid *B* to make 30 ml of liquid *C*.
Work out the density of liquid *C*.

..... g/cm^3

(4)

17. **[5 marks]**

. A solid snooker ball is made in the shape of a sphere.
The ball has a mass of 156 g measured to the nearest gram.
Its diameter is 57 mm measured to the nearest millimetre.
Find the lower bound for the density of the ball.
Give your answer correct to 3 significant figures.

..... g/cm^3

(4)

18. **[5 marks]**

. A solid metal bar is made in the shape of a cuboid.

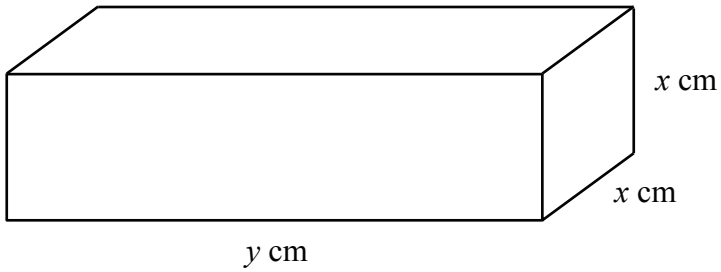


Diagram **NOT** accurately drawn

The cross-section of the bar is a square of side x cm.
The length of the bar is y cm.
The mass of the bar is M kg.
$x = 5.0$ correct to 1 decimal place.
$y = 25$ correct to the nearest whole number.
$M = 4.24$ correct to 2 decimal places.
Calculate the density of the metal, in g/cm^3, that was used to make the bar.
Give your answer to an appropriate degree of accuracy.

..... g/cm^3

(5)

19. **[5 marks]**

A solid cone is made of wood.

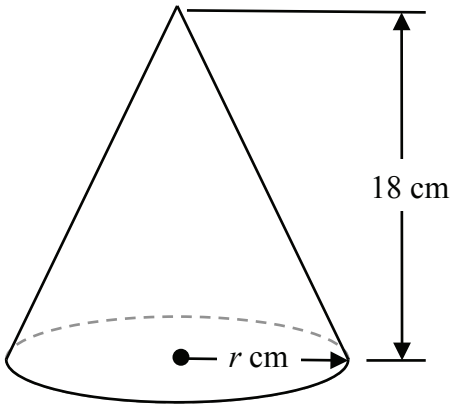


Diagram **NOT** accurately drawn

The height of the cone is 18 cm.
The mass of the cone is 0.98 kg
The wood has a density of 0.43 g/cm^3
Find the radius of the cone.
Give your answer correct to 2 significant figures.

..... cm

(5)

20. **[5 marks]**

. A solid sphere is made of glass.

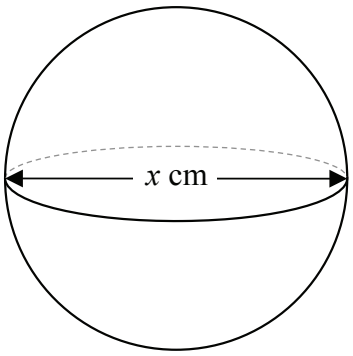


Diagram **NOT** accurately drawn

The mass of the sphere is 58.4 g
The density of the glass is 2.6 g/cm^3
Find the diameter of the sphere.
Give your answer correct to 3 significant figures.

..... cm

(5)

21. **[5 marks]**

A solid cube has a mass of 9.8 g.
It has a density of 0.92 g/cm^3.
Find the surface area of the cube.
Give your answer correct to 2 significant figures.

.....cm^2

(5)

22. **[5 marks]**

A squash ball is made of rubber and is the shape of a sphere.

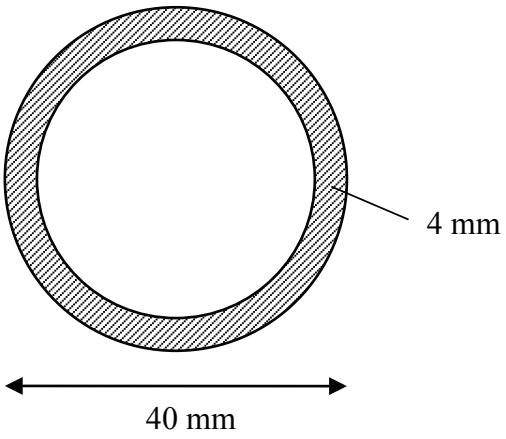


Diagram **NOT** accurately drawn

The mass of the ball 24 g.
The external diameter of the ball is 40 mm.
The thickness of the rubber is 4 mm.
Assuming that the mass of air inside the ball is negligible, calculate the density of the rubber.

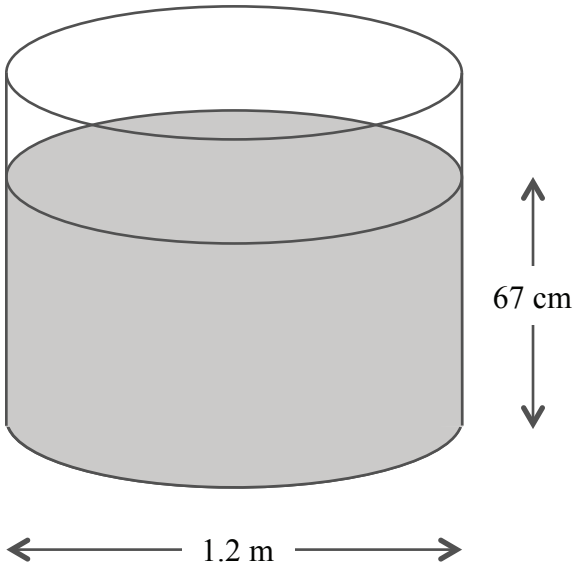
.....g/cm^3

(5)

23. **[5 marks]**

A 200 gallon steam kettle is used to make soup.
The kettle is in the shape of a cylinder.

Diagram **NOT** accurately drawn



The kettle has a diameter of 1.2 m.
The depth of the soup in the kettle is 67 cm.
The density of the soup is 1.15 g/cm^3.
The soup is to be dispensed into tins that hold 400 g of soup each.
How many tins can be filled with the soup from the kettle?
You must show all your working.

.....

(5)