**1** A solid metal sphere has radius 1.5 cm.
The mass of the sphere is 109.6 grams.

Work out the density of the sphere.
Give your answer correct to 3 significant figures.

.......................................................... $g/cm^3$

**(Total for Question 1 is 3 marks)**

**2** A block of wood has a mass of 3.5 kg.
The wood has density 0.65 kg/m³

(a) Work out the volume of the block of wood.
Give your answer correct to 3 significant figures.

m³

**(Total for Question 2 is 3 marks)**

**3** The density of gold is $19.3 \text{ g/cm}^3$
A gold bar has volume $150 \text{ cm}^3$

Work out the mass of the gold bar.

...................................................... g

**(Total for Question 3 is 2 marks)**

**4** Liquid A has a density of $0.7 \text{ g/cm}^3$.
Liquid B has a density of $1.6 \text{ g/cm}^3$.

$140 \text{ g}$ of liquid A and $128 \text{ g}$ of liquid B are mixed to make liquid C.

Work out the density of liquid C.

...................................................... $\text{g/cm}^3$

**(Total for Question 4 is 4 marks)**

**5**   Liquid **A** has a density of 1.2 g/cm$^3$

150 cm$^3$ of Liquid **A** is mixed with some of Liquid **B** to make Liquid **C**.

Liquid **C** has a mass of 210 g and a density of 1.12 g/cm$^3$

Find the density of Liquid **B**.

........................................... g/cm$^3$

**(Total for Question 5 is 4 marks)**

**6**    100ml of liquid A and 200ml of liquid B are mixed together to make liquid C.

Liquid A has a density of 0.7g/ml.
Liquid B has a density of 1.1 g/ml.

Work the density of liquid C.

................................................. g/ml

**(Total for Question 6 is 4 marks)**

**7** The diagram shows a solid cylinder made from iron.
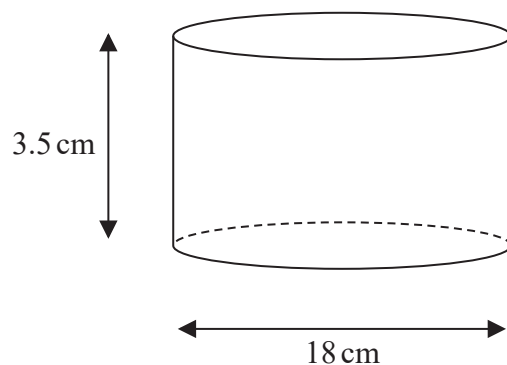
Diagram **NOT** accurately drawn

3.5 cm

18 cm

The cylinder has diameter 18 cm and height 3.5 cm
The mass of the cylinder is 7.04 kg

Work out the density of the iron.
Give your answer in g/cm$^3$ correct to 2 significant figures.

.......................................................... g/cm$^3$

**(Total for Question 7 is 3 marks)**

**8** The diagram shows a solid cuboid made from wood.

12 cm

8 cm

5 cm
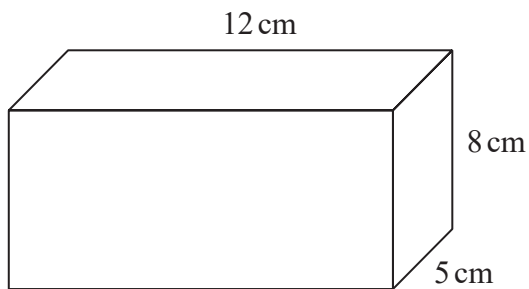
The wood has density $0.7 \, \text{g/cm}^3$

Work out the mass of the cuboid.

...................................................... grams

**(Total for Question 8 is 3 marks)**

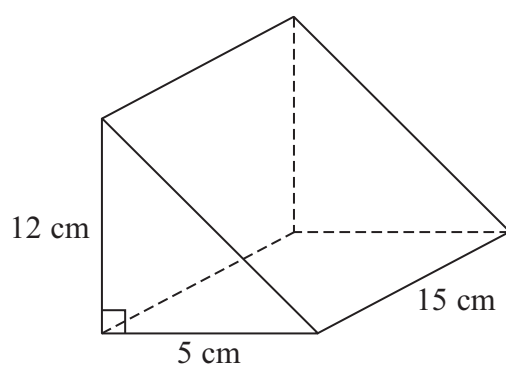**9** The diagram shows a solid triangular prism.

Diagram **NOT**
accurately drawn

12 cm

5 cm

15 cm

The prism is made from metal.
The density of the metal is 6.6 grams per cm$^3$.

Calculate the mass of the prism.

............................................... grams

**(Total for Question 9 is 3 marks)**

**10** Platinum nuggets are in the shape of a solid cylinder.
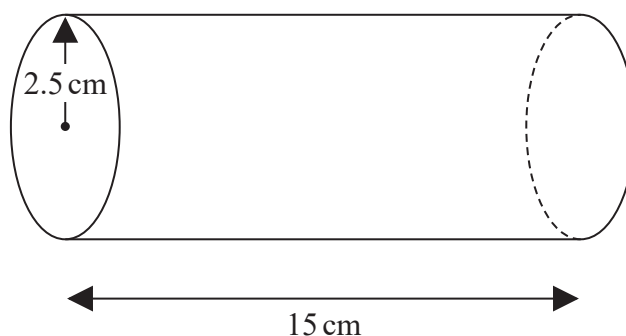


Diagram **NOT** accurately drawn

The radius of each cylinder is 2.5 cm.
The length of each cylinder is 15 cm.

The density of platinum is 21.5 g/cm³

The greatest mass that Jacques can carry is 30 kg.

Can Jacques carry 5 platinum nuggets at the same time?
You must show all your working.

**(Total for Question 10 is 5 marks)**

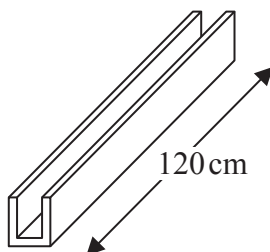**11** The diagram shows a metal bar in the shape of a prism.

120 cm

The length of the metal bar is 120 cm.
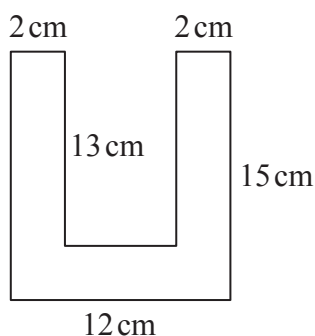The cross section of the metal bar is shown below.

2 cm     2 cm

13 cm

15 cm

12 cm

All corners are right angles.

The metal bar is made from steel with density 8 g/cm³.

Sean has a trolley.
The trolley can carry a maximum mass of 250 kg.

How many metal bars can the trolley carry at the same time?
You must show your working.

**(Total for Question 11 is 5 marks)**
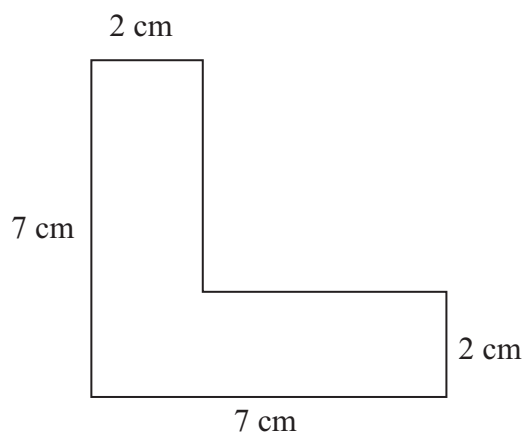
**12**

2 cm

7 cm

2 cm

7 cm

Diagram **NOT**
accurately drawn

The diagram shows the cross-section of a solid prism.
The length of the prism is 2 m.

The prism is made from metal.
The density of the metal is 8 grams per cm³.

Work out the mass of the prism.

.....................................

**(Total for Question 12 is 5 marks)**

**13**   Pablo made a solid gold statue.

He melted down some gold blocks and used the gold to make the statue.
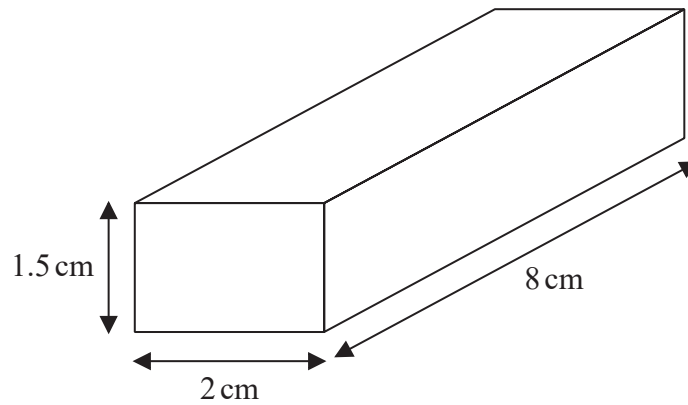Each block of gold was a cuboid, as shown below.

1.5 cm

8 cm

2 cm

The mass of the statue is 5.73 kg.
The density of gold is 19.32 g/cm$^3$

Work out the least number of gold blocks Pablo melted down in order to make the statue.
Show your working clearly.

.......................................................

**(Total for Question 13 is 5 marks)**

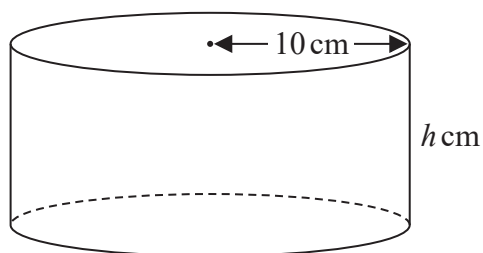**14** A solid aluminium cylinder has radius 10 cm and height $h$ cm.



Diagram **NOT** accurately drawn

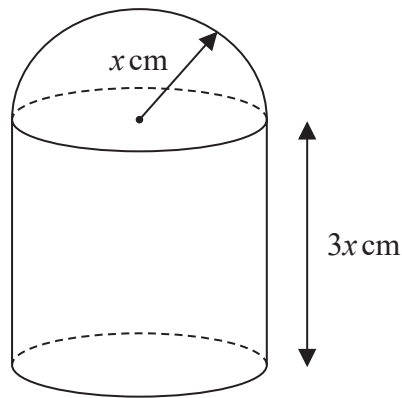The mass of the cylinder is 5.4 kg.
The density of aluminium is $0.0027 \text{ kg/cm}^3$

Calculate the value of $h$.
Give your answer correct to one decimal place.

$h =$ ......................................................

**(Total for Question 14 is 5 marks)**

**15** The diagram shows a solid made from a cylinder and a hemisphere.
The cylinder and the hemisphere are both made from the same metal.



Diagram **NOT** accurately drawn

The plane face of the hemisphere coincides with the upper plane face of the cylinder.

The radius of the cylinder and the radius of the hemisphere are both $x$ cm.
The height of the cylinder is $3x$ cm.

The total surface area of the solid is $81\pi\,\text{cm}^2$
The mass of the solid is 840 grams.

The following table gives the density of each of four metals.

| Metal | Density (g/cm$^3$) |
|---|---|
| Aluminium | 2.7 |
| Nickel | 8.9 |
| Gold | 19.3 |
| Silver | 10.5 |

The metal used to make the solid is one of the metals in the table.

Determine the metal used to make the solid.
Show your working clearly.