1. A silver chain has a volume of 5 cm^3.
The density of silver is 10.5 grams per cm^3.

Work out the mass of the silver chain.

……grams
(Total 2 marks)

2. The density of concrete is 2.3 grams per cm^3.

(a) Work out the mass of a piece of concrete with a volume of 20 cm^3.

..... grams
(2)

480 grams of a cheese has a volume of 400 cm^3.

(b) Work out the density of the cheese.

..... grams per cm^3
(2)
(Total 4 marks)

3.

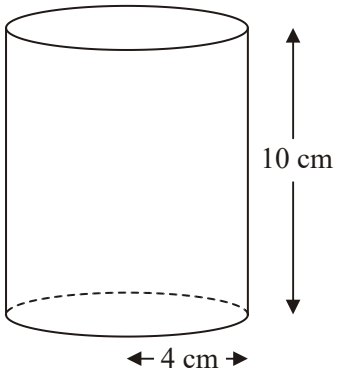

Diagram **NOT** accurately drawn

A solid cylinder has a radius of 4 cm and a height of 10 cm.

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

..... cm^3

(2)

The cylinder is made from wood.
The density of the wood is 0.6 grams per cm^3.

(b) Work out the mass of the cylinder.
Give your answer correct to 3 significant figures.

..... grams

(2)

(Total 4 marks)

4.

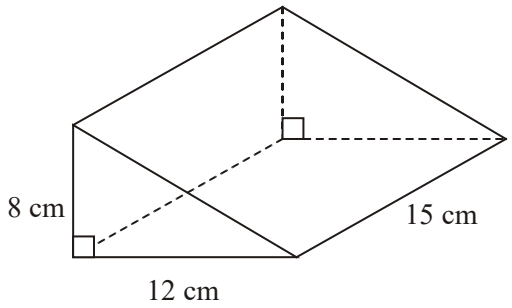

Diagram **NOT** accurately drawn

The diagram shows a solid triangular prism.

The prism is made of wood.
The wood has a density of 0.85 grams per cm^3.

Work out the mass of the prism.

..... grams

(Total 3 marks)

5. The volume of a gold bar is 100 cm^3.
The density of gold is 19.3 grams per cm^3.

Work out the mass of the gold bar.

..... grams
(Total 2 marks)

6.

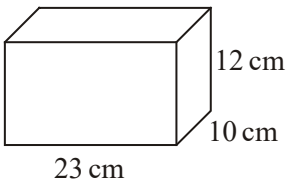

Diagram **NOT** accurately drawn

(a) Work out the volume of this solid cuboid.

..... cm^3
(2)

The solid cuboid is made of plastic.
The plastic has a density of 0.8 grams per cm^3.

(b) Work out the mass of the cuboid.

..... grams

(2)

(Total 4 marks)

1. 10.5×5
52.5g 2

M1 10.5 × 5
A1 cao

[2]

2. (a) $2.3 \times 20 = 46$ 2

M1 for 2.3 × 20
A1 cao

(b) $480 \div 400 = 1.2$ 2

M1 for 480 ÷ 400
A1 for 1.2 or equivalent reduced fraction

[4]

3. (a) $\pi \times 4^2 \times 10 = 502.65$
(502 – 503)
503 2

M1 $\pi \times 4^2 \times 10$ (= 502.65)
A1 502-503
SC B1 $\pi \times 8^2 \times 10$

(b) "502.65" × 0.6 = 301.59
302 2

M1 "502.65" × 0.6
A1 300 – 302 ft on "502.65" to an answer which would be correct on ft if rounded or truncated to 3SF

[4]

4. ½ × 12 × 8 × 15 × 0.85
612 3

M1 for ½ × 12 × 8 × 15 or 720 seen
M1 (indep) for their volume × 0.85
A1 cao
SC: If no marks scored, an answer of 1224 scores M0 M1 A0

[3]

5. 1930 2

M1 for 100 × 19.3
A1 for 1930 cao

[2]

6. (a) 23 × 10 × 12
2760 2

M1 for 23 × 10 × 12
A1 cao

(b) 2760 × 0.8
2208 2

M1 for '2760' × 0.8
A1 f.t.

[4]

1. Intermediate Tier

Most students realised that a multiplication was needed, and about half worked this out correctly. The most common wrong answer was 50.25 resulting from incorrect multiplication methods; if working was shown this still attracted a method mark. A few candidates multiplied one or both of the numbers by 3, clearly confused by the role of units.

Higher Tier

About three-quarters of the candidates were able to score full marks on this question. Most realised the need to multiply, but some were unable to do this accurately (common incorrect answers were 50.25 and 50.5).

2. **Paper 5523**

In part (a), almost 70% of candidates knew that they needed to multiply 2.3 by 20 but many were unable to perform this calculation correctly. The answer given was often of an inappropriate magnitude. A simple estimate (2 × 20) is sufficient to show that answers such as 10 and 4600 cannot possibly be correct. Part (b) was answered less well. About 40% of candidates knew that they had to calculate 480 ÷ 400 but this division defeated many. A common incorrect answer was 1.8.

Paper 5525

Most candidates were able to recall the correct method for finding the mass of the concrete in part (a), and the density of the cheese in part (b), but some were unable to cope with the calculations, particularly in the correct placement of the decimal point. 4.6, 16.0, 1600 and $\left(\frac{480}{400} = \right)$ 1.8 were common incorrect answer.

3. For a standard volume question this was poorly answered. Common errors included circumference × height, $k\pi r^2$ where k was usually 2 (from 2 ends?), 0.5 or 4. Some candidates evaluated $\pi \times 4^2$ as $(\pi \times 4)^2$.

Part (b) was generally well done with the vast majority of candidates multiplying their answer to part (a) by 0.6.

4. Finding the mass of the prism needed a strategy to obtain the correct result. Only 29% reached the correct answer of 612 grams. Calculating the area of the right-angled triangle followed by multiplying by the length was the first stage to obtain the volume of the prism.

Multiplying this volume by the density the second stage to achieve the final answer. There were various attempts at calculating the volume of the prism but a significant number used the dimensions to find the volume of a cuboid using $8 \times 12 \times 15 = 1440$ and forgetting to halve this result. There were also many candidates who calculated the surface area of the shape.

The second method mark was for the realisation that 'their' volume needed to be multiplied by 0.85 to produce the mass. For others it was somewhat of a gamble as to whether they should multiply or divide by 0.85. There were some very well written and organised solutions to this question in which each detail of the process was clearly shown. Around 40% scored 1 mark for either $\frac{1}{2}(8 \times 12 \times 5)$ or, more commonly, multiplying their volume by 0.85 A few candidates tried to cube 0.85 and multiply this by their volume. Several found the surface area of the shape rather than the volume and others just added together the dimensions of the prism.

5. Density is a well understood topic and the success rate in this question was very high with almost all candidates obtaining one mark for attempting to multiply 19.3 by 100 though the answer was only fully correct in about two thirds of cases.

6. This question was answered well. Over 85% of candidates gained 1 or more marks for their answers. Most candidates could find the volume of the cuboid though some attempts at finding the total surface area were seen. In part (b) nearly all candidates either multiplied or divided their answer to part (a) by 0.8. Those who multiplied were able to access both marks for this part. Full marks for the question were awarded to over a half of the candidates entered for this examination.