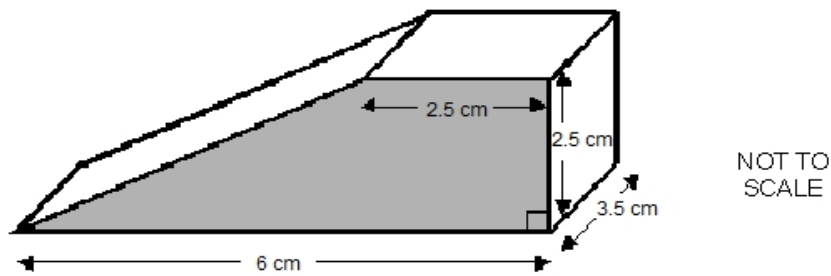


1.

### Wedges

This door wedge is the shape of a prism.



- (a) The shaded face of the door wedge is a trapezium.

Calculate the area of the shaded face.

Show your method

cm<sup>2</sup>

2 marks

(b) Calculate the volume of the door wedge.

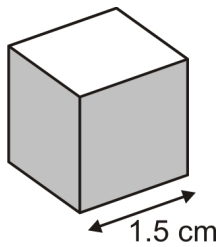
Show your method

cm<sup>3</sup>

1 mark

2.

Amit has some small cubes.

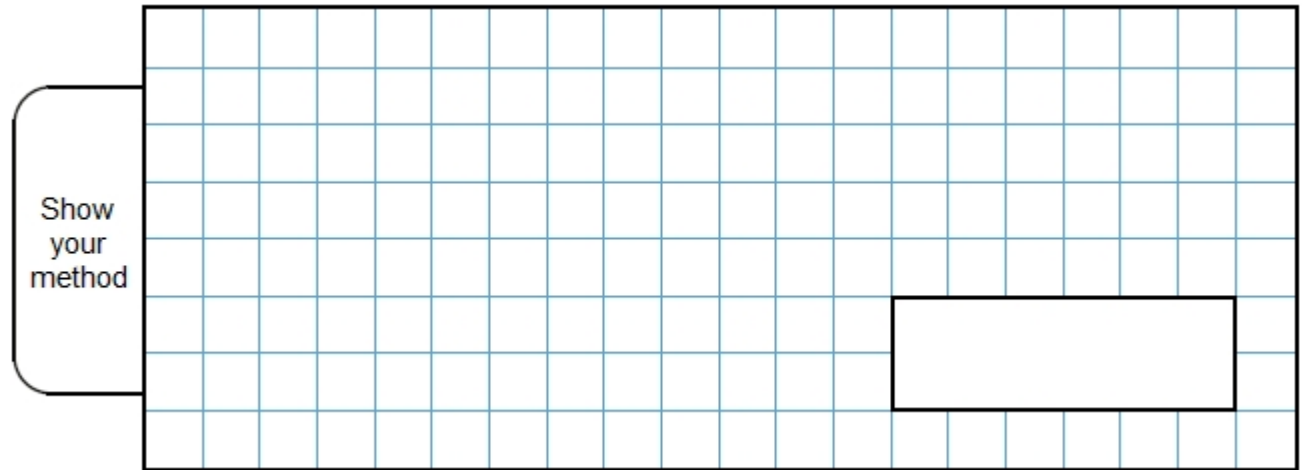


The edge of each cube is **1.5 centimetres**.

He makes a larger cube out of the small cubes.

The **volume** of this larger cube is **216 cm<sup>3</sup>**.

How many small cubes does he use?

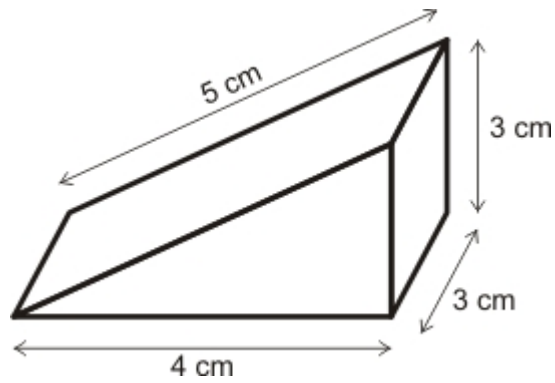


2 mark

3.

Calculate the volume of the prism.

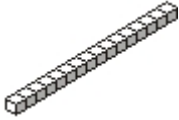
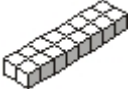


(Not to scale)



1 mark

**4.****Cuboids**

You can make only four different cuboids with **16 cubes**.

		Dimensions		
Cuboid <b>A</b>		1	1	16
Cuboid <b>B</b>		1	2	8
Cuboid <b>C</b>		1	4	4
Cuboid <b>D</b>		2	2	4

(a) Which of the cuboids **A** and **D** has the **larger surface area**?

Tick (✓) the correct answer below.

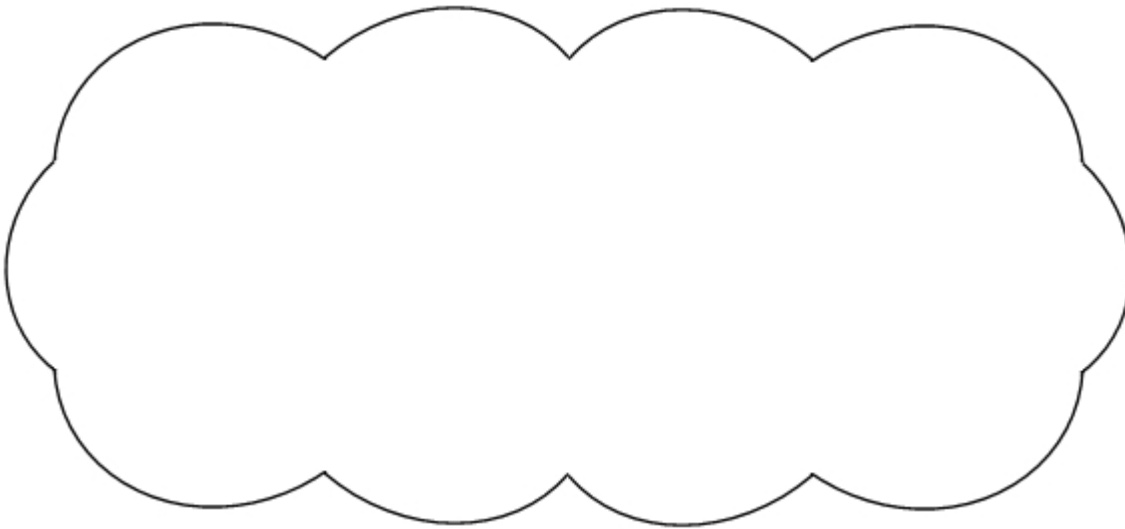
Cuboid A

Cuboid D

Both the same

1 mark

Explain how you know.



1 mark

(b) Which cuboid has the **largest volume**?

Tick (✓) the correct answer below.

Cuboid A

Cuboid B

Cuboid C

Cuboid D

All the same

1 mark

(c) How many of **cuboid D** make a cube of dimensions **4 × 4 × 4**?

\_\_\_\_\_

1 mark

(d) You can make only six **different** cuboids with **24 cubes**.

Complete the table to show the dimensions.

Two have been done for you.

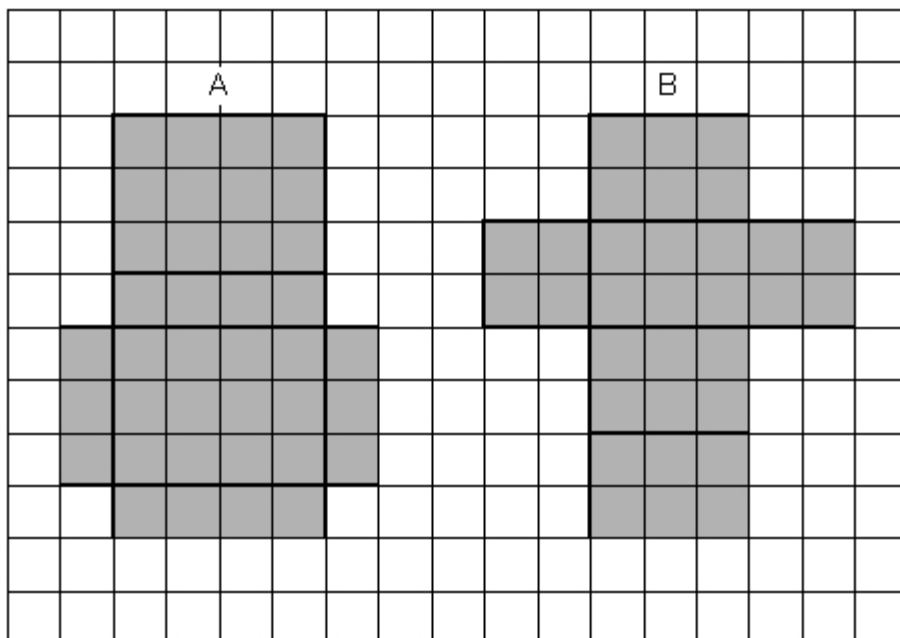
	Dimensions		
Cuboid E	1	1	24
Cuboid F	1	2	12
Cuboid G			
Cuboid H			
Cuboid I			
Cuboid J			

3 marks

5.

### Nets

The squared paper shows the nets of cuboid A and cuboid B.



(a) Do the cuboids have the **same surface area**?

Show calculations to explain how you know.

---

---

---

1 mark

(b) Do the cuboids have the **same volume**?

Show calculations to explain how you know.

---

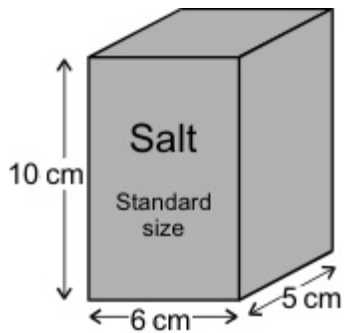
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2 marks

**6.** Salt

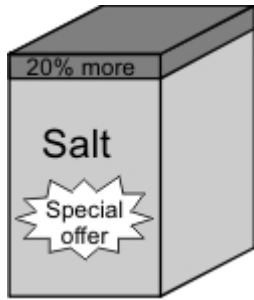
(a) What is the volume of this **standard size** box of salt?



cm<sup>3</sup>

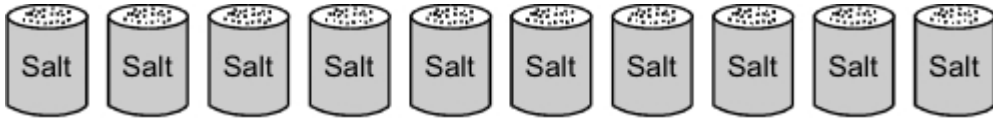
1 mark

(b) What is the volume of this **special offer** box of salt, which is **20% bigger**?



2 marks

The **standard size** box contains enough salt to fill up **10** salt pots



(c) How many salt pots may be filled up from the **special offer** box of salt?

1 mark



## Mark schemes

1.

- (a) **For 2m** indicates value is 10.625 rounded or truncated to 1 or more decimal places, eg:

- 10.625
- 10.62
- 10.6

**For only 1m** shows in working the correct substitution into the formula for the area of a trapezium

**or**

shows in working the trapezium divided into a square and a triangle and substitutes correctly into the formulae for the areas of these, eg:

- $\frac{(2.5 + 6.0)}{2} \times 2.5$
- $6.0 + 2.5 \div 2 \times 2.5$

- $2.5 \times 2.5 + \frac{1}{2} \times 3.5 \times 2.5$

*Accept **For 2m** answer given as 10.5 or 11 only if area has been calculated in working as 10.625*

2

- (b) Indicates value is 37.1875 rounded or truncated to 1 or more decimal places, eg:

- 37.1875
- 37.19
- 37.2

*Accept value given as 37 only if volume has been calculated in working as a value rounding to 37.2*

*Allow follow through where the answer given in part (a) is correctly multiplied by 3.5 (with the result rounded or truncated to 1 or more decimal places) eg:*

- 48.125 or 48.1 or 48.12 or 48.13
- if 13.75 is given for (a)
- 38.5 if 11 is given for (a)
- 35 if 10 is given for (a)

1

[3]

**2.**

Award **TWO** marks for the correct answer of 64

If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, eg

$$216 = 6 \times 6 \times 6$$

$$6 \div 1.5 = 4$$

$$\text{number of cubes} = 4 \times 4 \times 4$$

$$\text{OR } 1.5 \times 1.5 \times 1.5 = 3.375$$

$$\text{number of cubes} = 216 \div 3.375$$

*Calculation need not be completed for the award of the mark.*

Up to 2

[2]

**3.**

18 cm<sup>3</sup>

[1]

**4.**

(a) Indicates Cuboid A and gives a correct explanation

The most common correct explanations:

Show the correct surface area for both A and D

eg

- The surface area of A is 66, but D is 40

Consider the number of cube faces that are not visible

eg

- Each cube in D has 3 or 4 faces that cannot be seen but each cube in A has only 1 or 2
- Fewer faces of the cubes are touching each other in A

Consider the number of cube faces that are visible

eg

- In A the cubes show 4 or 5 faces, but in D it's 2 or 3
- There are more cube faces facing out on A than on D

! Units inserted

**Ignore**

**Accept minimally acceptable explanation**

eg, for the correct surface areas

- 66 and 40 seen
- $4 \times 16 + 2$  is bigger than  $4 \times 8 + 8$

eg, for cube faces that are not visible

- There are fewer hidden faces in A
- D is more compact

eg, for cube faces that are visible

- Cubes in A show 4 or more faces, D shows less than 4
- A has more faces showing
- A is more spread out

! Use of 'sides' for cube faces

**Condone**

**eg, accept**

- More sides face out on A

! Descriptors of cube faces

**Note that pupils use a wide range of terms to describe the cube faces**

**eg, for cube faces that are not visible**

- Hidden faces
- Faces pointing inside
- Faces touching

eg, for cube faces that are visible

- Faces facing out
- Faces showing
- Faces you can see

Condone provided the pupil does not explicitly refer to the area of only one of the faces of each cuboid

eg, do not accept

- You can see 8 faces on D and 16 faces on A

**Do not accept use of 'square' for cube or cuboid**

eg

- You can see more of each square's surface in A than in D

**Do not accept explanation is simply a description of one or both of the cuboids**

eg

- In A all 16 are in a line and not on top of each other
- D is two cubes high

**Do not accept incorrect statement**

eg

- Each cube in A shows 4 faces; D is 3

U1

- (b) Indicates All the same 1
- (c) 4 1
- (d) Shows, in any order, all four correct sets of dimensions  
eg
- 1     3     8
  - 1     4     6
  - 2     2     6
  - 2     3     4
- 3
- or** Shows three correct sets of dimensions 2
- or** Shows two correct sets of dimensions 1

*! Repeated sets of dimensions*  
**eg**

- 1     3     8
- 1     8     3(repeated)
- 2     2     6
- 6     2     2 (repeated)

Ignore the repeats and mark as 1, 0, 0

***Do not accept negative or non-integer dimensions used***

**[6]**

**5.**

- (a) Shows that the surface areas are different

The most common correct explanations:

Calculate A as 38, B as 32, eg

- A is  $4 \times 8 + 6 = 38$ , B is  $3 \times 8 + 8 = 32$

State that the difference is 6, eg

- A has 6 more squares than B

Manipulate the nets to a form where comparison may be drawn without further computation, eg

- A is  $6 \times 8 - 10$  but B would be  $6 \times 8 - 16$

*Accept minimally acceptable explanation, eg*

- 38, 32
- $4 \times 8 + 6$  isn't the same as  $3 \times 8 + 8$
- 6 more

*Do not accept incomplete explanation, eg*

- *I counted the squares*
- *There are more squares in A than in B*

**! Units given**

*Ignore, eg, accept*

- *38<sup>2</sup>cm, 32<sup>2</sup>*

1

(b) Shows that the volume of A is equal to that of B, eg

•

	length	width	height	volume
A:	4	3	1	12
B:	3	2	2	12

- A is  $3 \times 4 \times 1 = 12$ ,  
B is  $2 \times 3 \times 2 = 12$
- $3 \times 4 \times 1 = 2 \times 3 \times 2$
- A is one layer of 12 cubes and  
B is two layers of 6 cubes

2

**or** Shows the value 12, with no evidence of an incorrect method for this value

*Accept minimally acceptable explanation, eg*

- *Both 12*
- *12, 12*

*Do not accept incomplete explanation, eg*

- *Both the same*

**! Units given**

*Ignore*

**! Responses to parts (a) and (b) transposed but otherwise correct**

*Mark part (a) as 0 but mark part (b) as 1, 0*

1

[3]

6.

(a) Indicates 300

**Working need not be shown for the award of this mark.**

*Ignore use of cubed sign eg*

- $300^3$

**Do not accept** *incorrect attempt to convert to different units eg*

- 3
- 30

1

(b) For 2m indicates 360.

**For only 1m** shows 60 as 20% of 300 in working or given 60 as volume of the box.

**Working need not be shown for the award of any marks.**

*For 2m or 1m allow follow through from part (a), with correct rounding or truncation.*

**Award only 1m** for correct calculation indicated but not evaluated or incorrectly evaluated eg

- $12 \times 6 \times 5 = 432$
- $1.2 \times 300$
- $300 \times 20 \div 100 + 300$

**Do not accept** *height calculated as 12 with no further attempt to find the volume.*

2

(c) Indicates 12 salt pots.

**Working need not be shown for the award of this mark.**

*Allow follow through from part (a) or (b) with correct rounding or truncation.*

*Accept any indication eg*

- 2 more salt pots drawn on diagram given.

*Accept correct description eg*

- 2 more salt pots.

**Do not accept** *fractions of a salt pot.*

**Do not accept** *fewer than 10 salt pots eg*

- 2 salt pots.

1

[4]