

High School Mathematics Test 2015

Year 8

Volume

Non Calculator
Section

Skills and Knowledge Assessed:

- Draw different views of prisms and solids formed from combinations of prisms (ACMMG161)
- Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)
- Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198)
- Calculate the surface area and volume of cylinders and solve related problems (ACMMG217) Extension

Name _____

Answer all questions in the spaces provided on this test paper by:

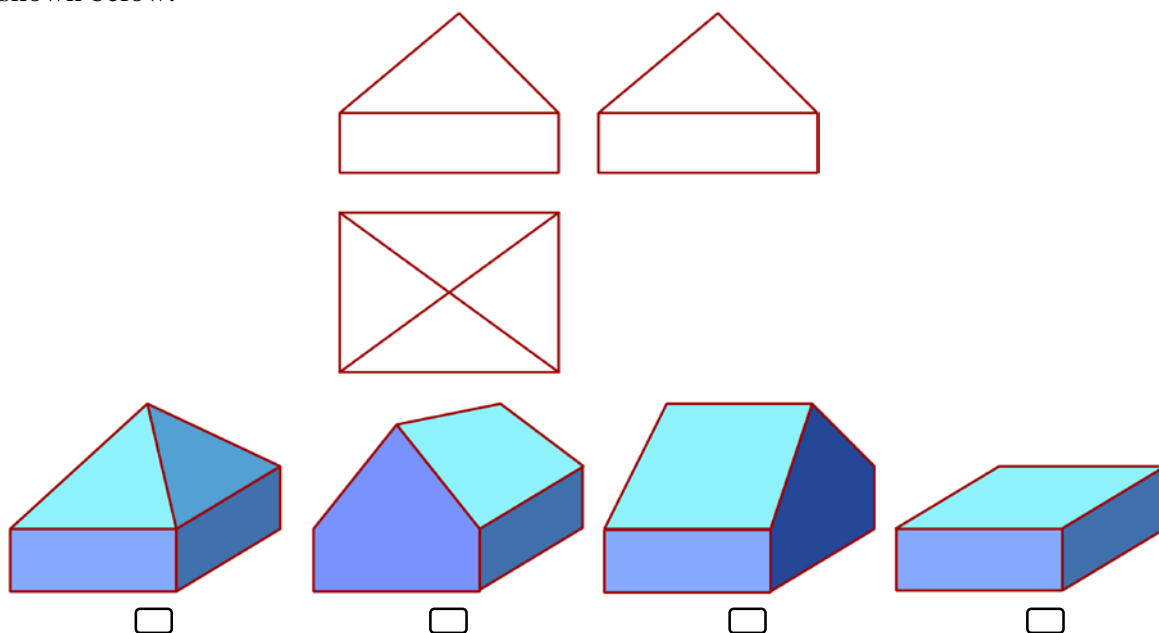
Writing the answer in the box provided.

or

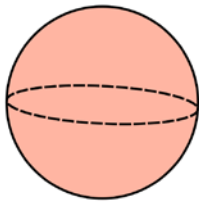
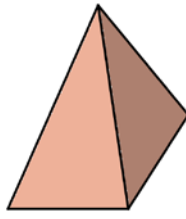
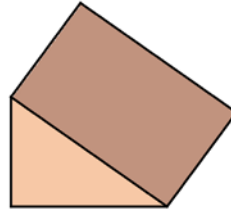
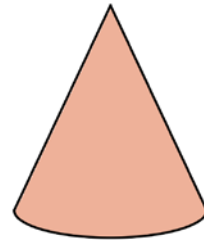
Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper. Calculators are **not** allowed.

1. Which diagram shows the three dimensional view of the solid whose plan and elevations are shown below.



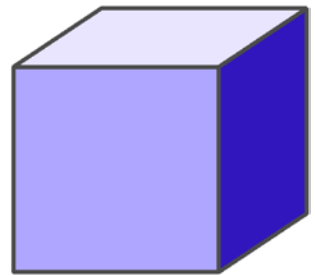
2. Which solid below could be described as a prism?

☐☐☐☐

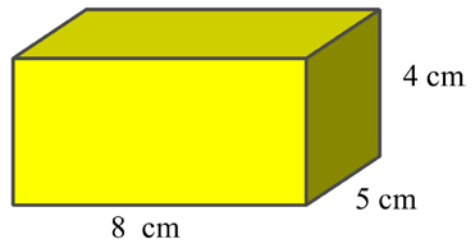
3. What is the volume of the cube shown?



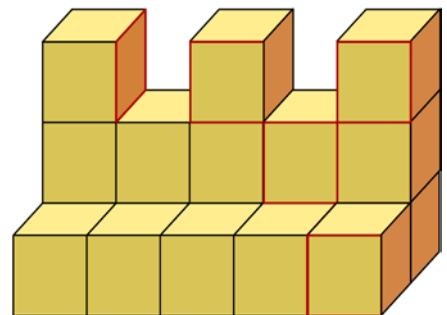
3 cm



4. What is the volume of the rectangular prism?



5. The solid is made by joining centimetre cubes together.
What is the volume of the solid?

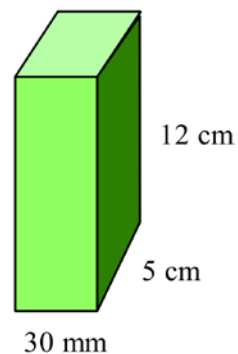


6. How many cubic centimetres are there in a cubic metre?

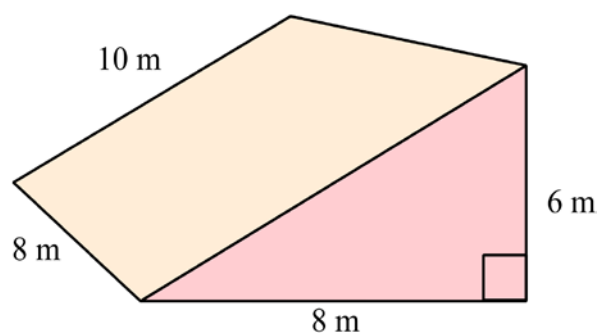
- ☐ 1 000
- ☐ 10 000
- ☐ 100 000
- ☐ 1 000 000

7. What is the volume of the prism shown in cm^3 ?

- ☐ 18 cm^3
☐ 180 cm^3
☐ $1\,800 \text{ cm}^3$
☐ $18\,000 \text{ cm}^3$

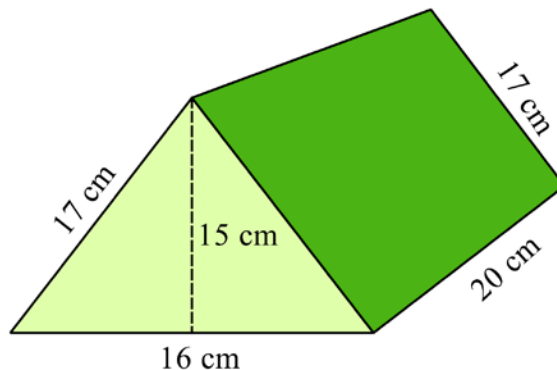


8. Find the volume of the triangular prism shown.

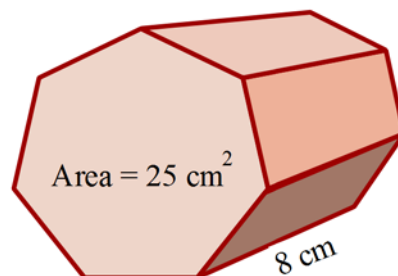


9. What is the volume of the triangular prism shown?

- ☐ $1\,360 \text{ m}^3$
☐ $2\,400 \text{ m}^3$
☐ $2\,720 \text{ m}^3$
☐ $4\,800 \text{ m}^3$

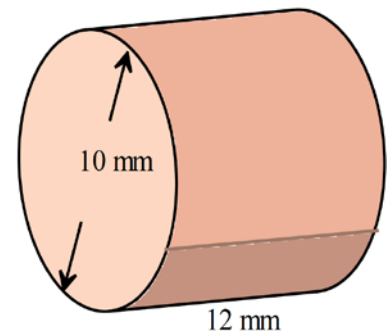


10. The area of the heptagonal base of this prism is 25 cm^2 .
What is the volume of the prism?

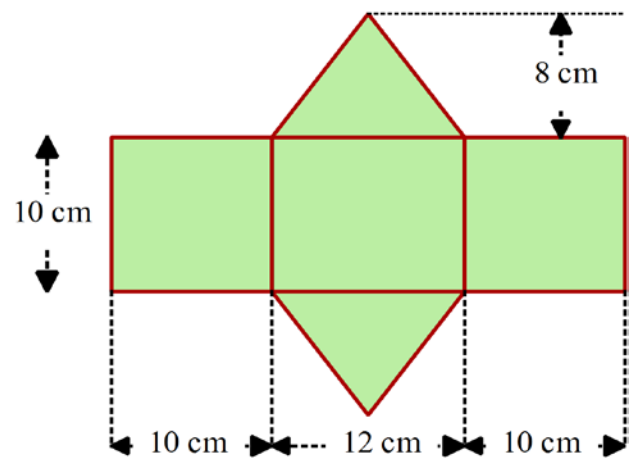


11. What is the volume of the cylinder, in terms of π .

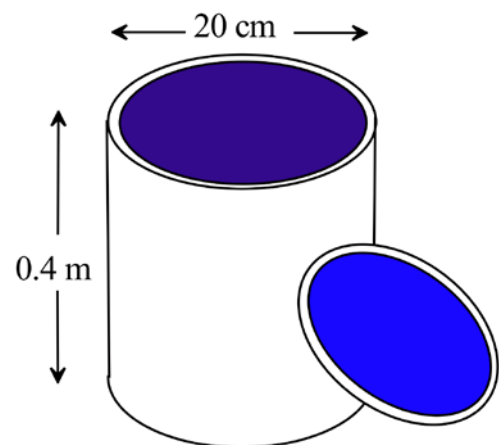
- ☐ $120\pi \text{ mm}^3$
☐ $300\pi \text{ mm}^3$
☐ $900\pi \text{ mm}^3$
☐ $1\,200\pi \text{ mm}^3$



12. What is the volume of the prism whose net is shown here?



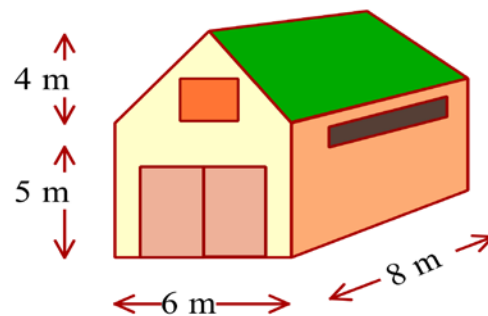
13. What volume of paint would the cylindrical can hold.
Answer in cm^3 and in terms of π .



14.

A barn has the dimensions shown.

Calculate the volume of the barn in cubic metres.

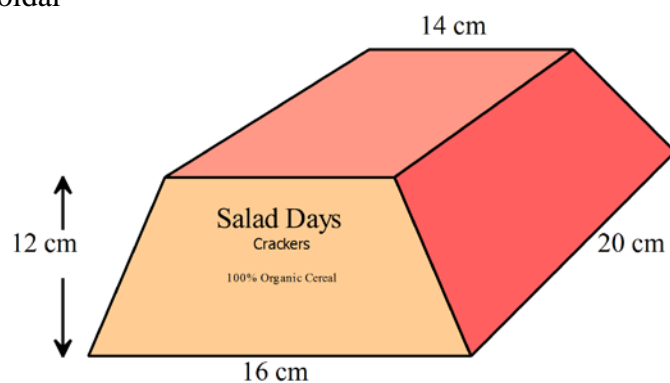


15.

A food package is in the form of a trapezoidal prism.

The dimensions are shown.

Find the volume of the package.



High School Mathematics Test 2015

Year 8

Volume

Calculator Allowed
Short Answer
Section

Name _____

Answer all questions in the spaces provided on this test paper by:

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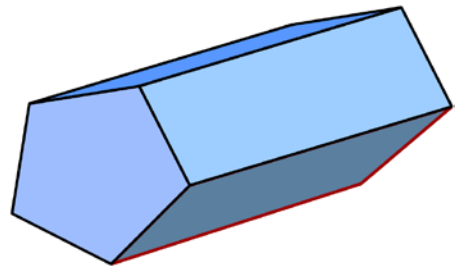
or

Shading in the bubble for the correct answer from the four choices provided.

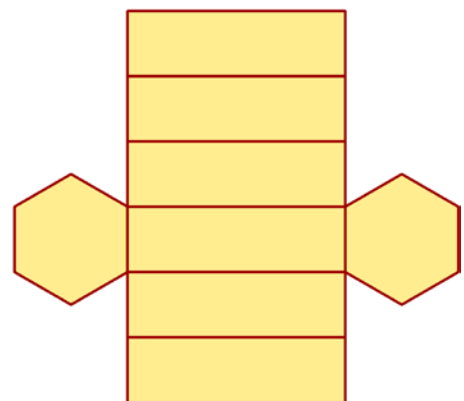
Show any working out on this test paper. Calculators are allowed.

1. What name could be given to the solid below?

- ☐ Hexagonal prism
- ☐ Hexagonal pyramid
- ☐ Pentagonal prism.
- ☐ Pentagonal pyramid.

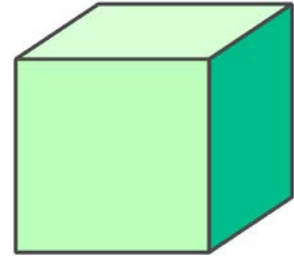


2. What name would be given to a solid whose net is shown below?

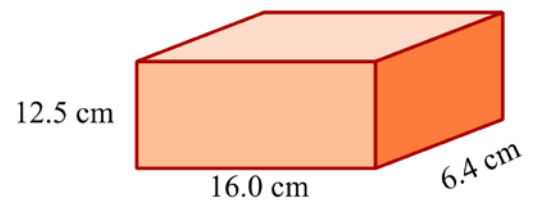


3. A cube has a volume of 17.576 cm^3 ?
What is its side length?

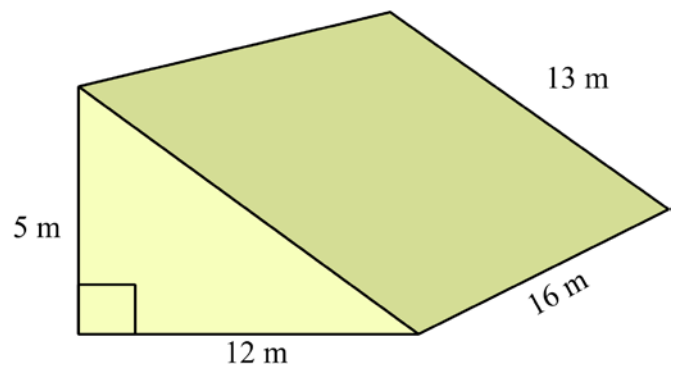
- ☐ 2.6 cm
☐ 4.2 cm
☐ 5.8 cm
☐ 8.8 cm



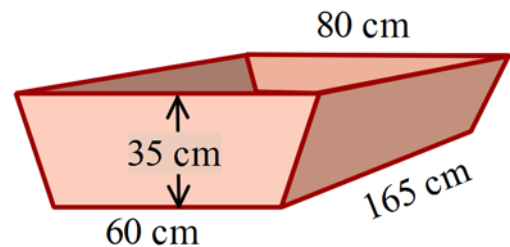
4. What is the volume of the rectangular prism?



5. Find the volume of the triangular prism shown.



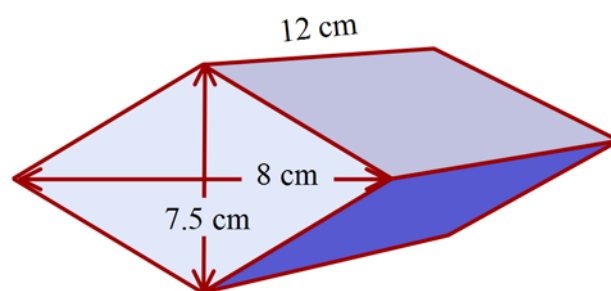
6. A water trough is in the shape of a trapezoidal prism.
It is 35 cm deep and 165 cm long.
What is its volume, correct to the nearest cm^3 ?



- ☐ $186\,450 \text{ cm}^3$
☐ $404\,250 \text{ cm}^3$
☐ $606\,375 \text{ cm}^3$
☐ $808\,500 \text{ cm}^3$

7. The prism has a rhombus as its base.
What is its volume?

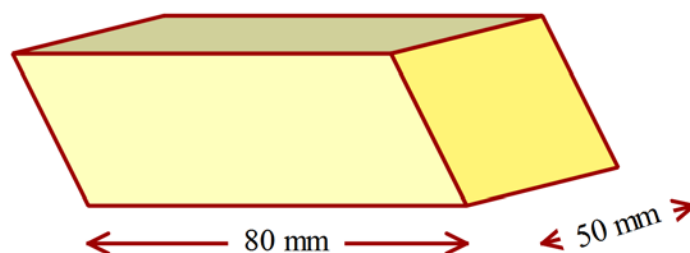
- ☐ 30 cm^3
☐ 90 cm^3
☐ 180 cm^3
☐ 360 cm^3



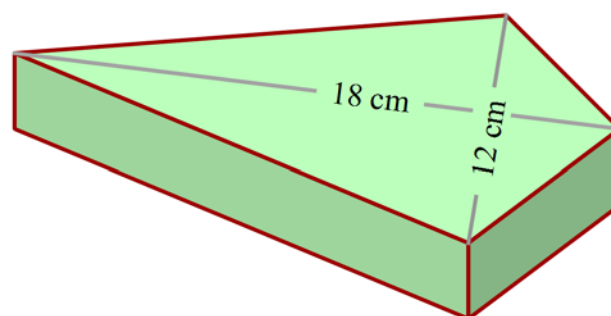
8. An eraser is in the shape of a prism with a parallelogram as its cross section.

What is the volume of the eraser in mm^3 ?

45 mm

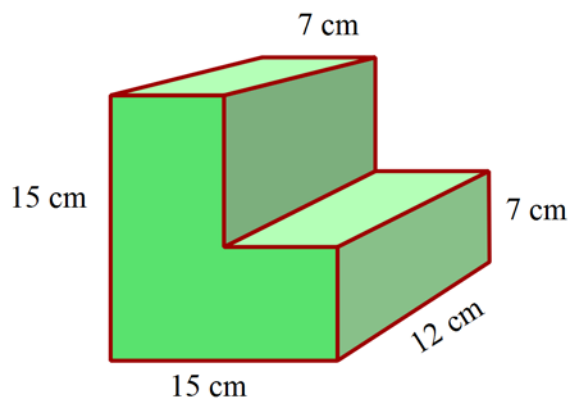


9. A paperweight is a prism with a face in the shape of a kite, as shown.
It is 3 cm thick and made of glass.
What volume of glass is used to make the paperweight?



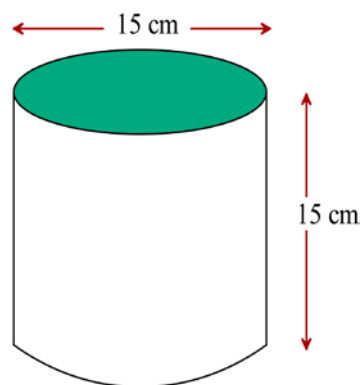
10. What is the volume of the solid shown?

- ☐ 161 cm³
☐ 966 cm³
☐ 1 932 cm³
☐ 2 112 cm³



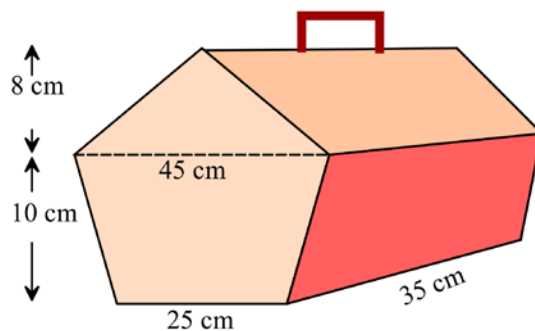
11. What is the volume of the cylinder to the nearest cm³?

- ☐ 707 cm³
☐ 2 651 cm³
☐ 5 301 cm³
☐ 10 603 cm³

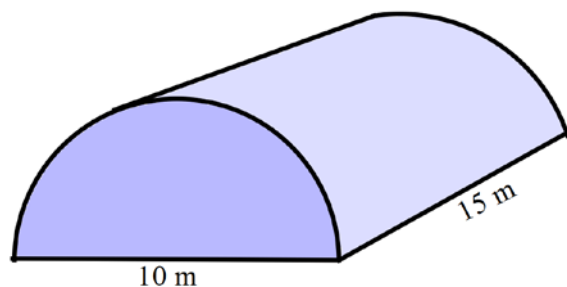


12. The diagram shows a picnic hamper.
Find the volume of the hamper?

- ☐ 18 550 cm³
☐ 24 850 cm³
☐ 30 800 cm³
☐ 37 100 cm³

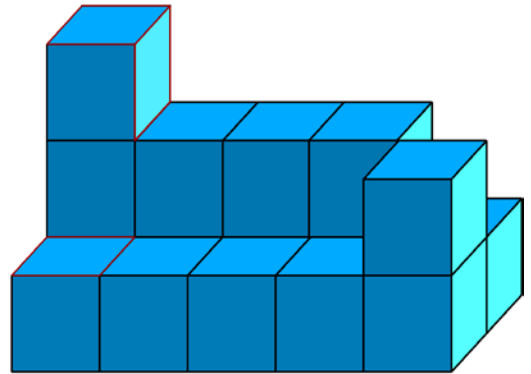


13. A storage hut is in the shape of a half cylinder.
The diameter of the semicircle is 10 metres and the length of the hut is 15 metres.
What is its volume to the nearest cubic metre?



14.

Jack is building a prism from 1 cm^3 cubes. What is the least number of cubes he must add to produce a prism?

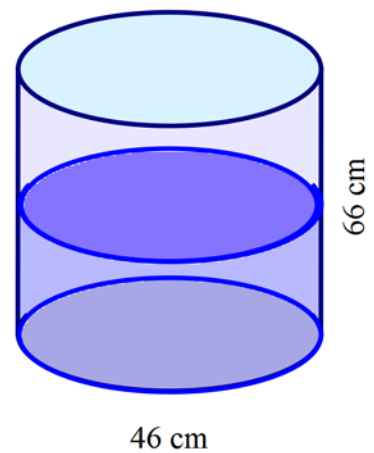


15.

A cylindrical water cooler is 66 cm high and has a diameter of 46 cm.

It is currently half full, and is used to fill cups that hold 400 ml.

Given that 1000 cm^3 holds 1 litre, how many more cups could be filled from the cooler?



High School

Mathematics Test 2015

Year 8

Volume

Non Calculator
Section

ANSWERS

No.	WORKING	ANSWER
1.	1 st has pyramid above a prism	1 st answer
2.	3 rd is a triangular prism	3 rd answer
3.	$V = 3^3 = 27$	27 cm ³
4.	$V = 5 \times 4 \times 8$ $= 160 \text{ cm}^3$	160 cm ³
5.	Bottom row = 10 cm ³ Second row = 5 cm ³ Top row = 3 cm ³ Total volume = 18 cm ³	18 cm ³
6.	1 cubic metre = $100 \times 100 \times 100 \text{ cm}$ $= 1\,000\,000 \text{ cm}^3$	4 th answer
7.	30 mm = 3 cm $V = 3 \times 5 \times 12$ $= 180 \text{ cm}^3$	2 nd answer
8.	$V = \frac{1}{2} \times 8 \times 6 \times 8$ $= 192 \text{ m}^3$	192 m ³

9.	$V = \frac{1}{2} \times 16 \times 15 \times 20$ $= 8 \times 300$ $= 2400 \text{ m}^3$	1 st answer
10.	$V = Al$ $= 25 \times 8$ $= 200 \text{ cm}^3$	200 cm ³
11.	$V = \pi r^2 h$ $= \pi \times 5^2 \times 12$ $= 300\pi \text{ mm}^3$	2 nd answer
12.	$V = \frac{1}{2} \times 12 \times 8 \times 10$ $= 480 \text{ cm}^3$	480 cm ³
13.	$0.4 \text{ m} = 40 \text{ cm}$ $V = \pi r^2 h$ $= \pi \times 10^2 \times 40$ $= 4000\pi \text{ cm}^3$	4000π cm ³
14.	$\text{Area end} = 5 \times 6 + \frac{1}{2} \times 6 \times 4$ $= 30 + 12$ $= 42 \text{ m}^2$ $\text{Volume} = 42 \times 8$ $= 336 \text{ m}^3$	336 m ³
15.	$\text{Area trapezium} = \frac{12}{2}(14 + 16)$ $= 6 \times 30$ $= 180 \text{ cm}^2$ $\text{Volume} = 180 \times 20$ $= 3600 \text{ cm}^3$	3 600 cm ³

High School

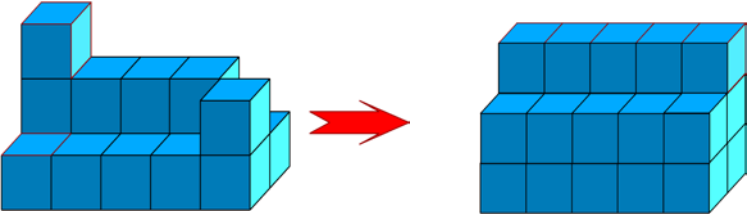
Mathematics Test 2015

<p style="text-align: center; font-size: 1.5em;"><i>Volume</i></p> <p>Year 8</p>	<p>Calculator Allowed</p> <p>Short Answer</p> <p>Section</p>
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ANSWERS

No.	WORKING	ANSWER
1.	It is a Pentagonal prism.	3 rd answer
2.	Hexagonal prism	Hexagonal prism
3.	$V = \text{side}^3$ $17.576 = \text{side}^3$ $\text{side} = \sqrt[3]{17.576}$ $= 2.6 \text{ cm}$	1 st answer
4.	$V = 12.5 \times 16 \times 6.4$ $= 1\,280 \text{ cm}^3$	1 280 cm ³
5.	$V = \frac{1}{2} \times 12 \times 5 \times 16$ $= 480 \text{ m}^3$	480 m ³
6.	$\text{Area trapezium} = \frac{35}{2}(60 + 80)$ $= \frac{35}{2} \times 140$ $= 2450 \text{ cm}^2$ $\text{Volume} = 2450 \times 165$ $= 404\,250 \text{ cm}^3$	2 nd answer

7.	$\text{Area rhombus} = \frac{1}{2} \times 8 \times 7.5$ $= 30 \text{ cm}^2$ $\text{Volume} = 30 \times 12$ $= 360 \text{ cm}^3 \text{ (nearest tenth)}$	4 th answer
8.	$\text{Area parallelogram} = 80 \times 45$ $= 3600 \text{ mm}^2$ $\text{Volume} = 3600 \times 50$ $= 180\,000 \text{ mm}^3$	180 000 mm ³
9.	$\text{Area kite} = \frac{1}{2} \times 18 \times 12$ $= 108 \text{ cm}^2$ $\text{Volume} = 108 \times 3$ $= 324 \text{ cm}^3$	324 cm ³
10.	$\text{Area cross section} = 15 \times 7 + 8 \times 7$ $= 105 + 56$ $= 161 \text{ cm}^2$ $\text{Volume} = 161 \times 12$ $= 1\,932 \text{ cm}^3$	3 rd answer
11.	$\text{radius} = \frac{15}{2} = 7.5$ $\text{Area circle} = \pi \times 7.5^2$ $= 176.714$ $\text{Volume} = 176.714 \times 15$ $= 2650.71$ $= 2\,651 \text{ cm}^3 \text{ (nearest cm}^3\text{)}$	2 nd answer
12.	$\text{Area cross section} = \text{trapezium} + \text{triangle}$ $= \frac{10}{2}(45 + 25) + \frac{1}{2} \times 45 \times 8$ $= 5(70) + 180$ $= 350 + 180$ $= 530 \text{ cm}^2$ $\text{Volume} = 530 \times 35$ $= 18\,550 \text{ cm}^3$	1 st answer

13.	$\text{radius} = \frac{10}{2} = 5$ $\text{Area semicircle} = \frac{\pi \times 5^2}{2}$ $= 39.270$ $\text{Volume} = 39.270 \times 15$ $= 589.0486$ $= 589 \text{ m}^3 \text{ (nearest m}^3 \text{)}$	589 m ³
14.	 <p>Extra needed 5 on second row and 4 on top row to make a prism.</p> <p>Total needed = 9 cubes.</p>	9 cubes
15.	$1000\text{cm}^3 = 1 \text{ litre} = 1000 \text{ ml}$ <p>so $1 \text{ cm}^3 = 1 \text{ ml}$</p> $V = \pi \times 23^2 \times 66$ $= 109\,686 \text{ cm}^3 \text{ (ml)}$ <p>Half full so has 54 843 ml</p> $\text{Number of cups} = \frac{54843}{400}$ $= 137.1075$ <p>137 cups could be filled</p>	137 cups