School Name
Mathematics Test 2017

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:

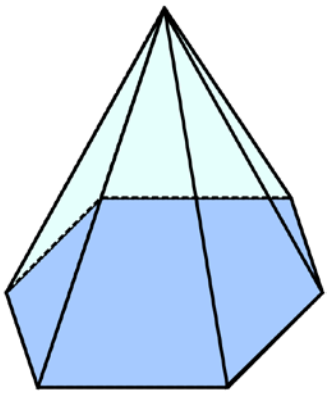
Writing the answer in the box provided.

or

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

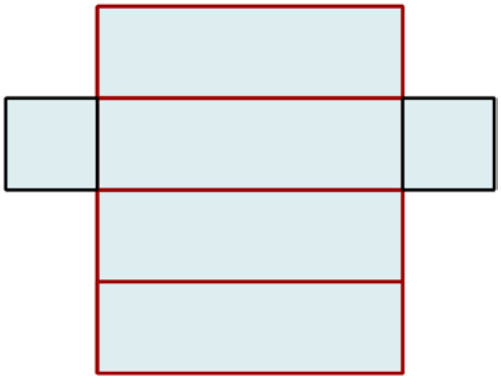
Show any working out on the test paper. Calculators are **not** allowed.

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



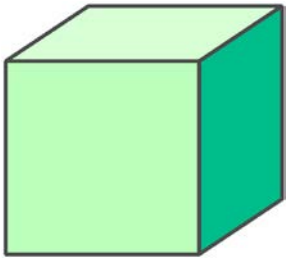
- ☐ Hexagonal prism
- ☐ Hexagonal pyramid
- ☐ Octagonal prism.
- ☐ Octagonal pyramid.

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



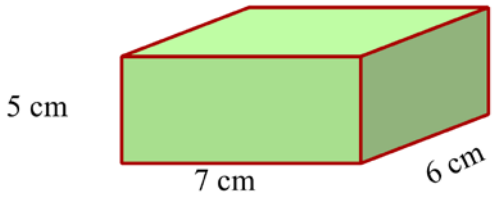
3. A cube has a side length of 5 cm?

What is its volume?

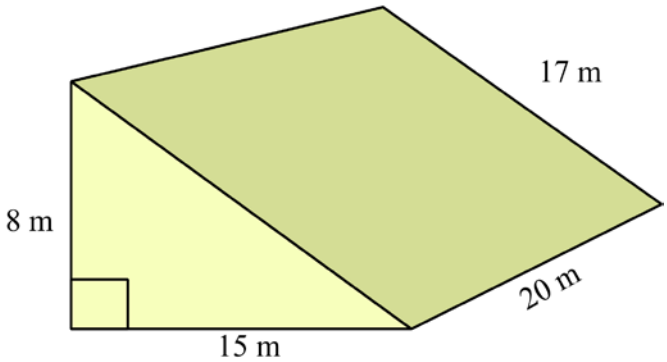


- ☐ 25 cm^3
- ☐ 50 cm^3
- ☐ 125 cm^3
- ☐ 250 cm^3

4. What is the volume of the rectangular prism?



5. Find the volume of the triangular prism shown.

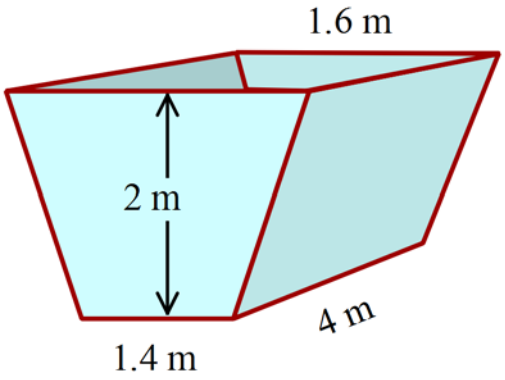


- ☐ 240 cm^3
- ☐ 920 cm^3
- ☐ 1020 cm^3
- ☐ 1200 cm^3

6. A garbage skip bin is in the shape of a trapezoidal prism.

It is 2 m deep and 4 m long. It is 1.6 m wide at the top and 1.4 m wide at the bottom

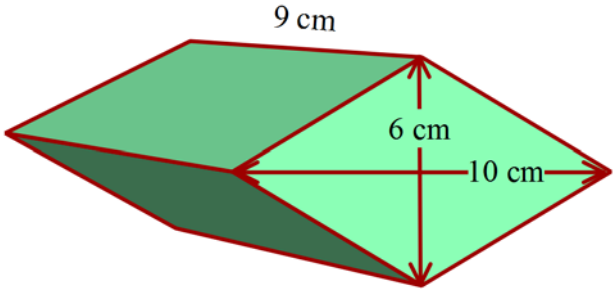
What is its volume in cubic metres?



- ☐ 12 m^3
- ☐ 18 m^3
- ☐ 24 m^3
- ☐ 36 m^3

7. The prism has a rhombus as its base.

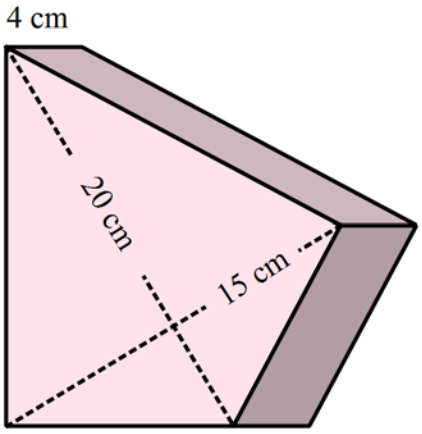
What is its volume?



- ☐ 30 cm^3
- ☐ 90 cm^3
- ☐ 270 cm^3
- ☐ 540 cm^3

8. A trophy is a prism with a kite as its cross-section with the dimensions shown.

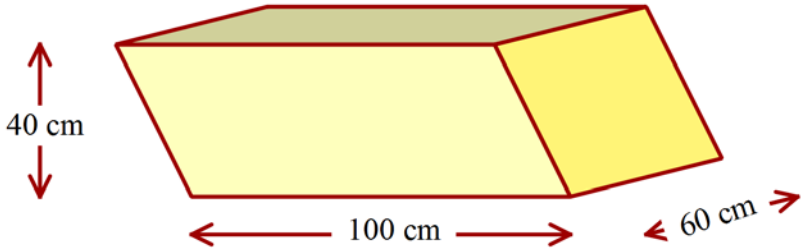
What is its' volume?



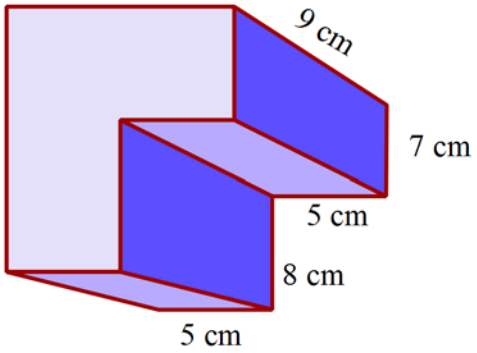
- ☐ 300 cm^3
- ☐ 600 cm^3
- ☐ 750 cm^3
- ☐ 1 200 cm^3

9. A prism is shown, whose cross-section is a parallelogram.

What is the volume of the prism?

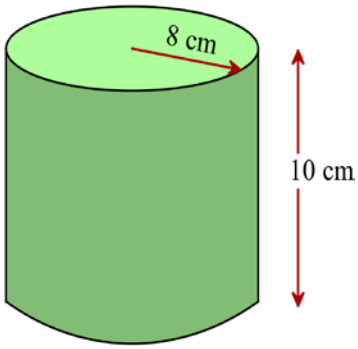


10. What is the volume of the solid shown?



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

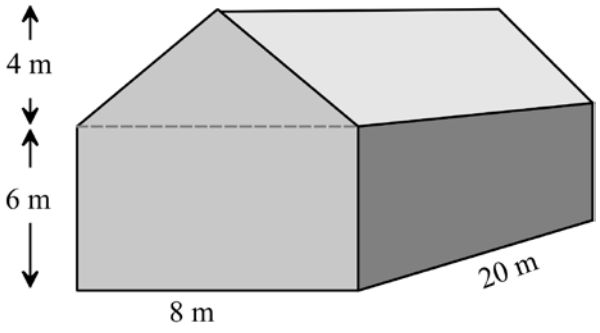
- ☐ 160π cm^3
- ☐ 640π cm^3
- ☐ 800π cm^3
- ☐ 2560π cm^3



12. A storage shed is shown at right.

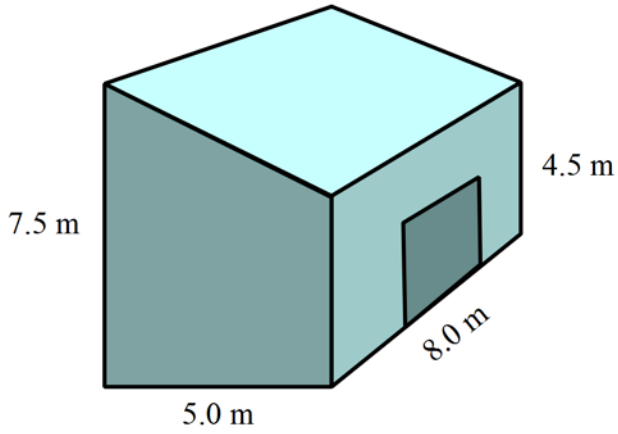
Find the volume of the shed?

- ☐ 800 m^3
- ☐ 960 m^3
- ☐ 1280 m^3
- ☐ 1600 m^3



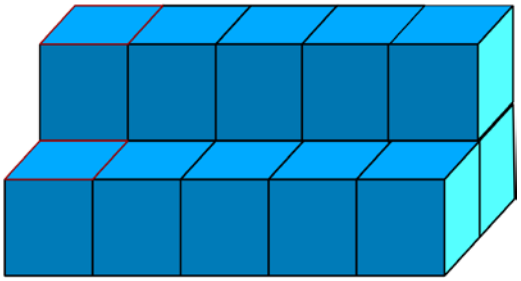
13. A building has the dimensions shown.

What is its volume?



14. A prism is made up of cubes which have 2 cm edges, as shown.

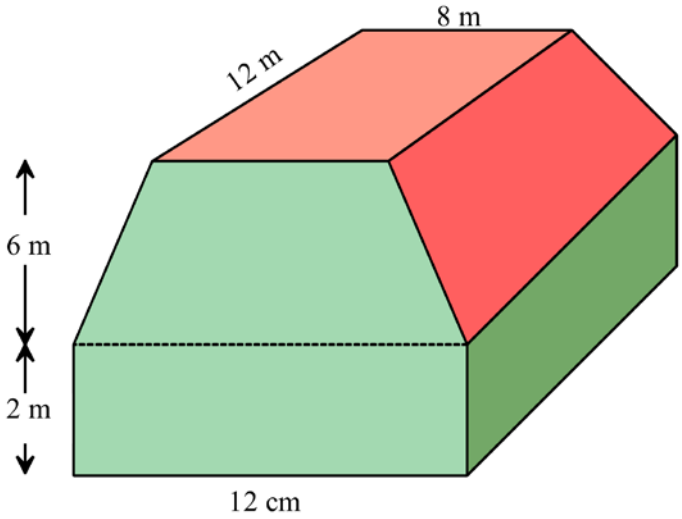
What is the volume of the prism?



15. A food package is in the form of a trapezoidal prism on top of a rectangular prism.

The dimensions are shown.

Find the volume of the package.



School Name

Mathematics Test 2017

Volume

Year 8

Calculator Allowed
Short Answer Section

Name_____

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

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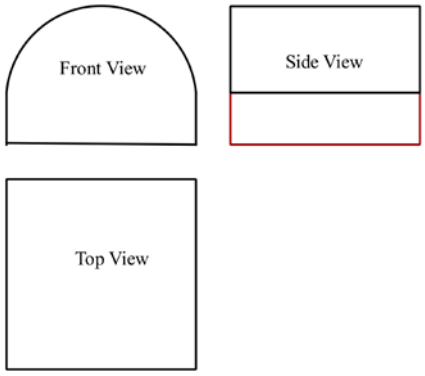
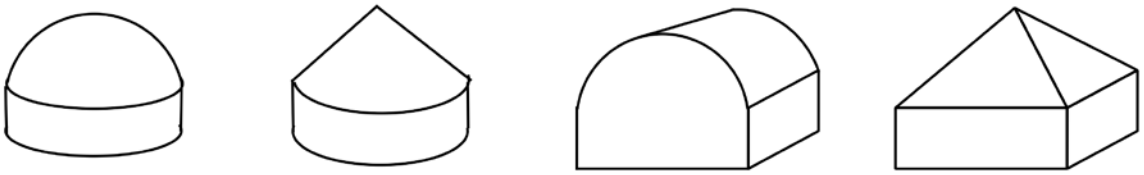
or

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

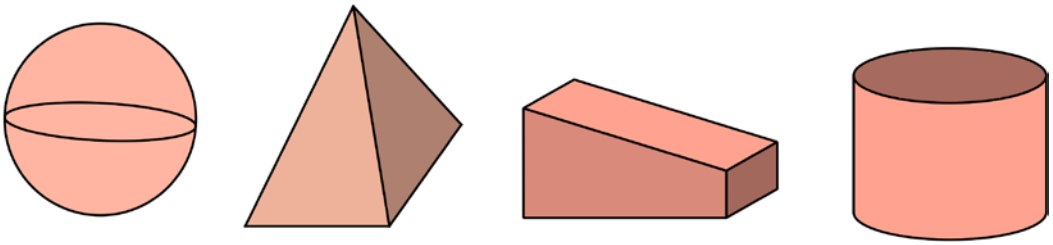
Show any working out on this test paper. Calculators are allowed.

1. Which diagram shows the three-dimensional view of the solid whose top and side views are shown below.



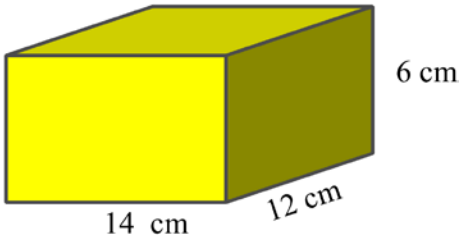


2. Which solid below could be described as a pyramid?



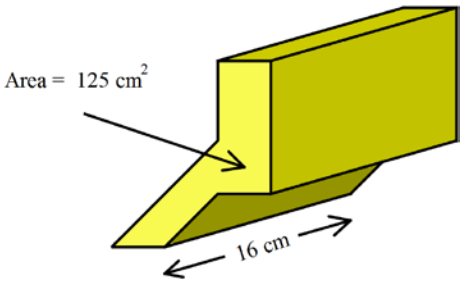
☐ ☐ ☐ ☐

3. What is the volume of the rectangular prism?

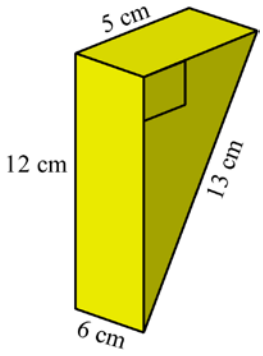


4. The cross section of the prism shown is 125 cm^2.

What is the volume of the prism?



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



☐ 90 cm^3

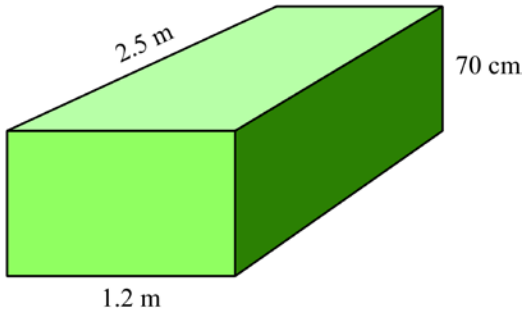
☐ 120 cm^3

☐ 180 cm^3

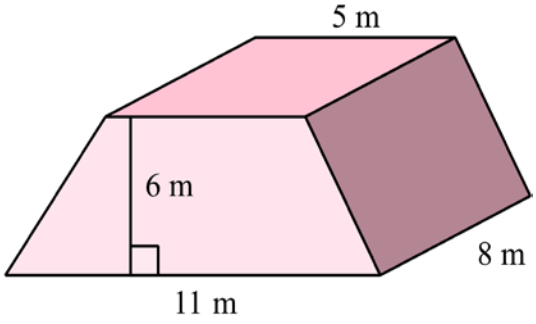
☐ 360 cm^3

6. What is the volume of the prism shown in m^3?

- ☐ 2.1 m^3
- ☐ 210 m^3
- ☐ 21 000 m^3
- ☐ 2 100 000 m^3

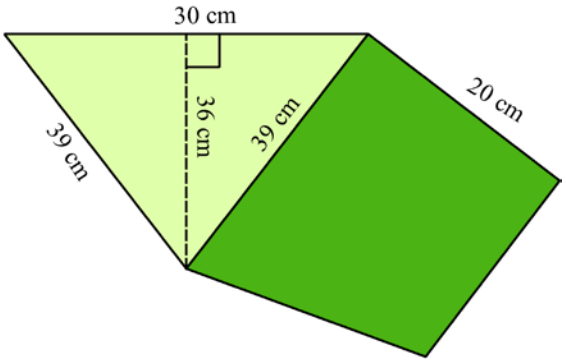


7. Find the volume of the trapezoidal prism shown.



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

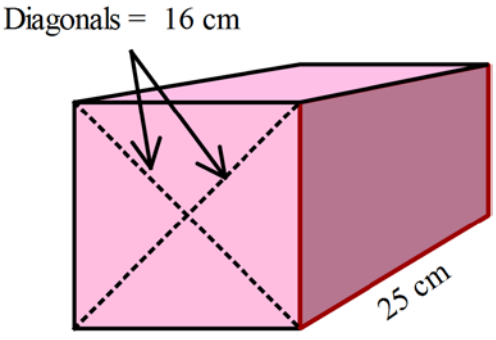
- ☐ 5 400 cm^3
- ☐ 10 800 cm^3
- ☐ 11 700 cm^3
- ☐ 21 600 cm^3



9. Each diagonal of a square prism is 16 cm in length and the prism is 25 cm long.

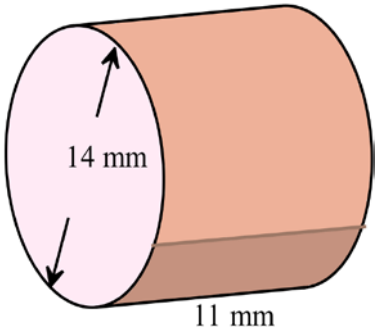
What is the volume of the prism?

(Remember that a square is also a rhombus.)

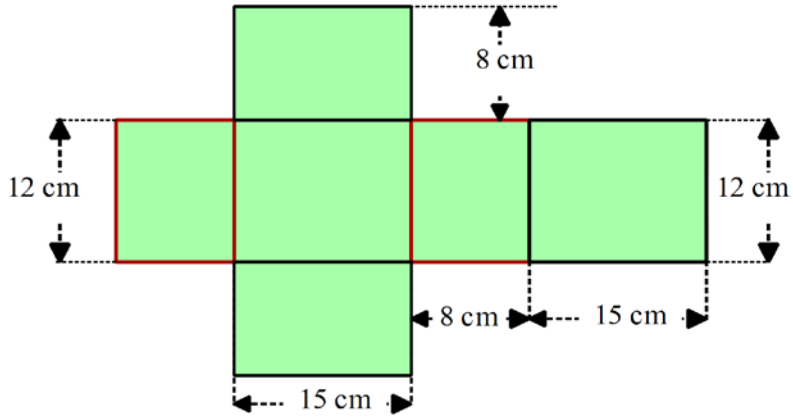


10. What is the volume of the cylinder, correct to the nearest 100 mm^3?

- ☐ 1 600 mm^3
- ☐ 1 700 mm^3
- ☐ 6 700 mm^3
- ☐ 6 800 mm^3

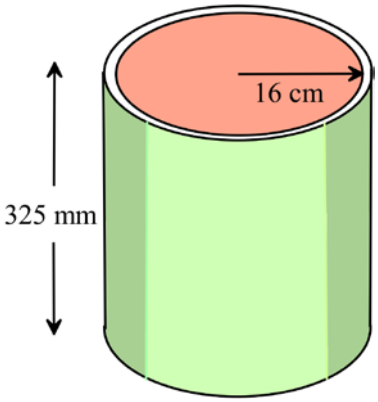


11. What is the volume of the rectangular prism whose net is shown here?



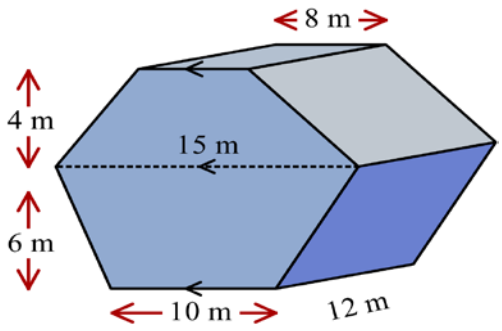
12. What is the volume of this cylindrical tin?

Answer correct to the nearest cm^3.



13. An irregular hexagonal prism has the dimensions shown.

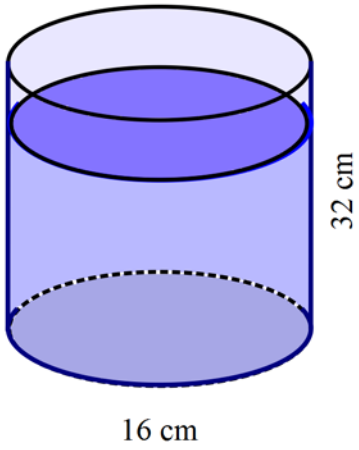
Calculate the volume of the prism in cubic metres.



14. A cylindrical container has a diameter of 16 cm and is 32 cm high.

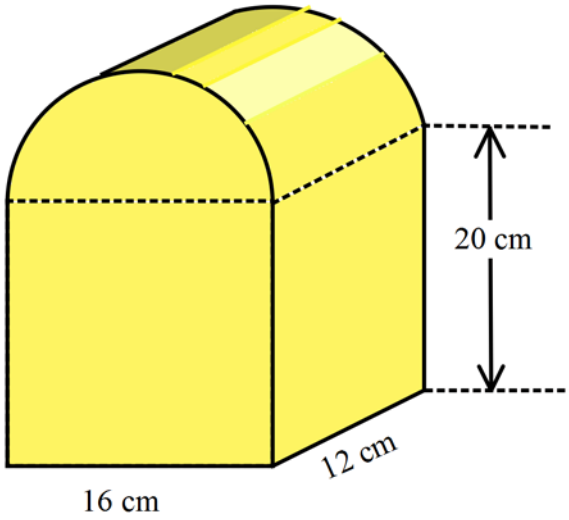
It is currently three-quarters full of water.

Given that 1000 cm^3 holds 1 litre, how many litres of water does the container currently hold? (to the nearest 10^{th} of a litre.)



15. The cross section of this prism is a semi-circle atop a rectangle.

Find the volume of the prism correct to the nearest cubic centimetre.



School Name
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Year 8 — *Volume* — Non Calculator Section

ANSWERS

Question	Working and Answer
1.	**It is a Hexagonal pyramid.**
2.	**A square prism**
3.	$V = \text{side}^3$ $V = 6^3$ $V = 25 \times 5$ $= 125$ cm **3rd Answer**
4.	$V = 5 \times 7 \times 6$ $= 7 \times 30$ $= 210$ cm^3
5.	$V = \frac{1}{2} \times 8 \times 15 \times 20$ $= 4 \times 300$ $= 1200$ m^3 **4th Answer**
6.	Area trapezium $= \frac{2}{2}(1.4 + 1.6)$ $= 1 \times 3.0$ $= 3$ m^2 Volume $= 3 \times 4$ $= 12$ m^3 **1st Answer**

Question	Working and Answer
7.	Area rhombus $= \frac{1}{2} \times 6 \times 10$ $= 30 \text{ cm}^2$ Volume $= 30 \times 9$ $= 270 \text{ cm}^3$ **3rd Answer**
8.	Area kite $= \frac{1}{2} \times 20 \times 15$ $= 150 \text{ cm}^2$ Volume $= 150 \times 4$ $= 600 \text{ cm}^3$ **2nd Answer**
9.	Area parallelogram $= 40 \times 100$ $= 4000 \text{ cm}^2$ Volume $= 4000 \times 60$ $=$ **240 000 cm^3**
10.	Area cross section $= 5 \times 8 + 10 \times 7$ $= 40 + 70$ $= 110 \text{ cm}^2$ Volume $= 110 \times 9$ $=$ **990 cm^3**
11.	Area circle $= \pi \times 8^2$ $= 64\pi$ Volume $= 64\pi \times 10$ $= 640\pi \text{ cm}^3$ **2nd Answer**
12.	Area cross section =rectangle + triangle $= 6 \times 8 + \frac{1}{2} \times 8 \times 4$ $= 48 + 16$ $= 64 \text{ m}^3$ Volume $= 64 \times 20$ $= 1280 \text{ m}^3$ **3rd Answer**

Question	Working and Answer
13.	Area cross section $= \frac{1}{2} \times 5\ (7.5\ +\ 4.5)$ $= \frac{1}{2} \times 5 \times 12$ $= 30\ m^2$ Volume $= 30\ \times\ 8$ $=$ **$240\ m^3$**
14.	Volume of each cube $= 2^3\ =\ 8\ cm^3$ Number of cubes $= 3 \times 5\ =\ 15$ Volume of prism $= 15 \times 8$ $=$ **$120\ cm^3$**
15.	Area Trapezium $= \frac{6}{2}(8 + 12))$ $= 3 \times 20$ $= 60\ m^2$ Area Rectangle $= 12 \times 2$ $= 24\ m^2$ Area cross section $= 60 +\ 24\ =\ 84\ m^2$ Volume $= 84 \times 12$ $=$ **$1008\ \ m^3$**

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Calculator Allowed
Short Answer
Section

ANSWERS

Question	Working and Answer
1.	3rd shape has half of a cylinder on top of a rectangular prism, which from above appears as a rectangle and the side as two rectangles. **3rd Answer**
2.	Only the 2nd is a pyramid. **2nd Answer**
3.	$V = 14 \times 12 \times 6$ $= \mathbf{1008\ cm^3}$
4.	$V = A \times l$ $= 125 \times 16$ $= \mathbf{2000\ cm^3}$
5.	$V = \frac{1}{2} \times b \times h \times l$ $= \frac{1}{2} \times 5 \times 12 \times 6$ $= 180\ cm^3$ **3rd Answer**

6.	As result needed in cubic metres, convert 70 cm to 0.7 m. Volume = $1.2 \times 2.5 \times 0.7$ $= 2.1\ m^3$ **1st Answer**
7.	Area Trapezium = $\frac{6}{2} \times (5 + 11)$ $= 3 \times 16$ $= 48\ m^2$ Volume = $A\ l$ $= 48 \times 8$ $=$ **$384\ m^3$**
8.	$V = \frac{1}{2} \times 30 \times 36 \times 20$ $= 10\ 800\ m^3$ **2nd Answer**
9.	Area of Square = Area of Rhombus $= \frac{1}{2} \times 16 \times 16$ $= 128\ cm^2$ Volume = 128×25 $=$ **$3200\ cm^3$** (Could also use Pythagoras to find side length of square)
10.	$V = \pi r^2 h$ $= \pi \times 7^2 \times 11$ $= 1693.3184402$ $= 1700\ mm^3$ (nearest $100\ mm^3$) **2nd Answer**
11.	$V = 12 \times 15 \times 8$ $=$ **$1440\ cm^3$**
12.	Write all dimensions in cm first. $V = \pi r^2 h$ $= \pi \times 16^2 \times 32.5$ $= 26138.050877$ $=$ **$26\ 138\ cm^3$ (to nearest cm^3)**

13.	Area end = Area of 2 trapezia $= \frac{6}{2}(15 + 10) + \frac{4}{2}(15 + 8)$ $= 3 \times 25 + 2 \times 23$ $= 121\ m^2$ Volume = 121×12 **$= 1452\ m^3$**
14.	Depth of water = $32 \times \frac{3}{4} = 24$ $V = \pi r^2 h$ $= \pi \times 8^2 \times 24$ $= 4825.486\ cm^3$ Capacity = $4825.486 \div 1000$ **= 4.8 litres**
15.	Area end = $\pi \times 8^2 \div 2 + 16 \times 20$ $= 100.53096 + 320$ $= 420.53096\ cm^2$ Volume = 420.53096×12 5046.372 **$= 5\ 046\ cm^3$**