JP Maths Revision

Attempt the paper before watching the solutions https://www.youtube.com/@JPMathsRevision

Foundation / Higher Tier

Volume of Prisms

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

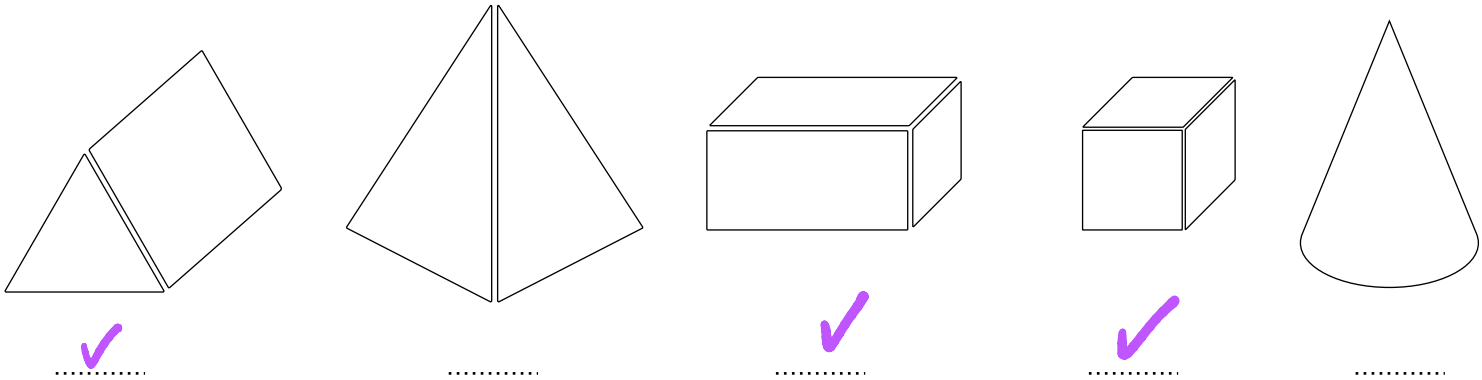
Information

- The marks for **each** question are shown in brackets- *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

1. Which of the following shapes are *prisms*?
Tick (✓) all that apply.



✓ .... ✓ ..... ✓ ....

(Total for Question 1 is 2 marks)

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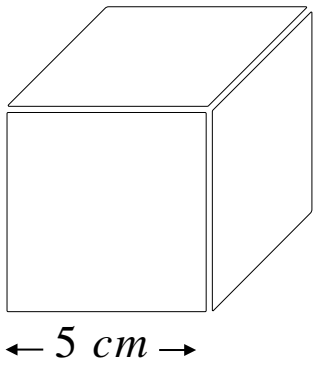
2. Work out the volume of the cube with side length 5cm.



5 x 5 x 5 = 125

125 ..... cm^3

(Total for Question 2 is 2 marks)

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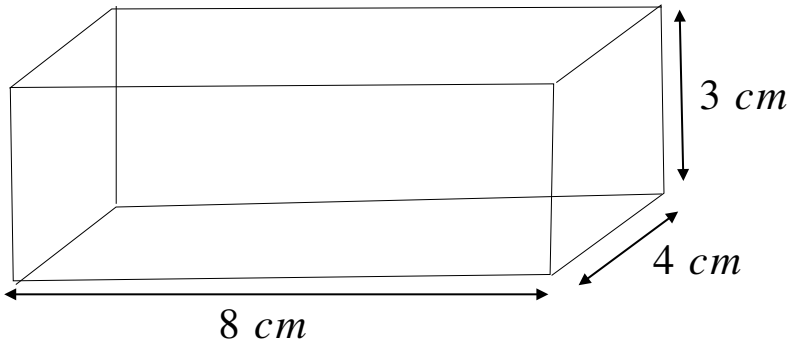
3. Below is cuboid.

Work out the volume of the cuboid.



8 x 4 x 3 = 96

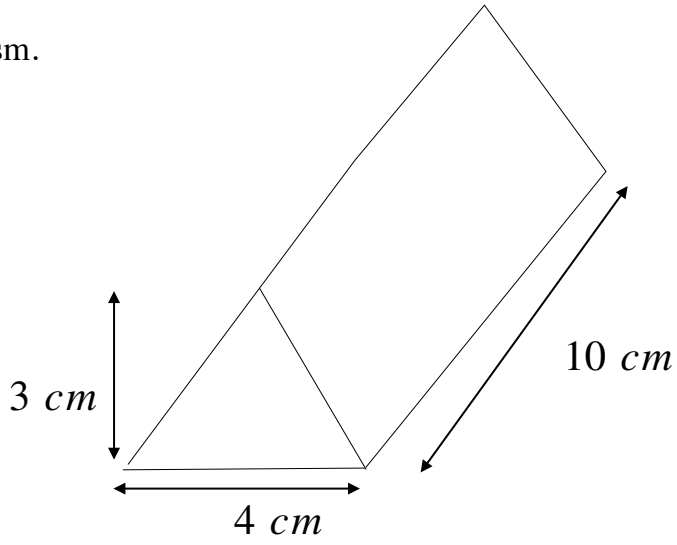
96 ..... cm^3

(Total for Question 3 is 2 marks)

4. Work out the volume of the below triangular prism.

$\frac{3 \times 4}{2} = 6$

$6 \times 10 = 60$



60 ..... cm^3

(Total for Question 4 is 3 marks)

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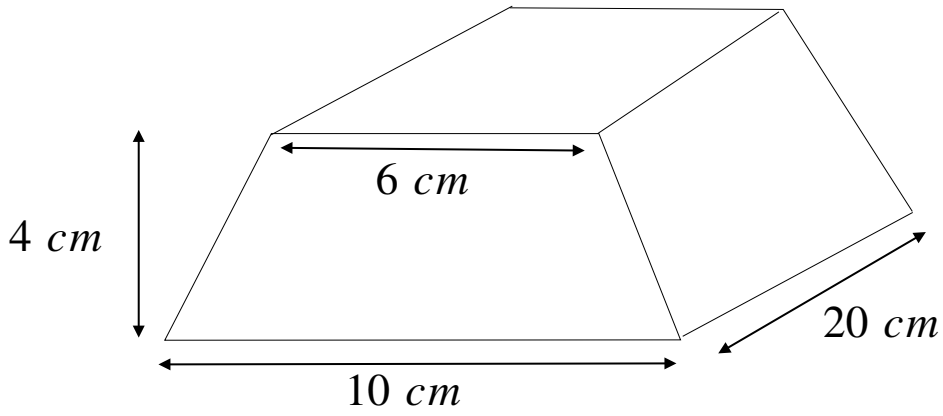
5. Work out the volume of the below trapezium prism.

$\frac{1}{2}(6+10) \times 4$

$= 32$

$32 \times 20 = 640$

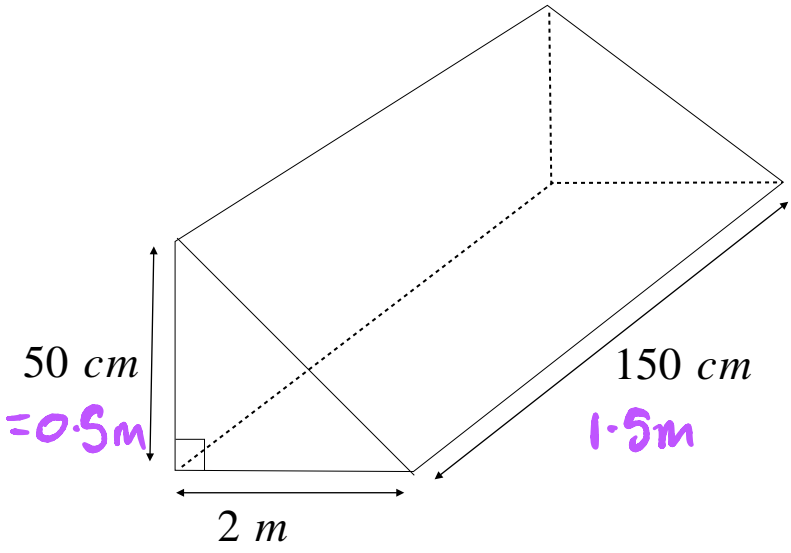


640 ..... cm^3

(Total for Question 5 is 3 marks)

6. Below is triangular prism.

Work out the volume. Include units with your answer.



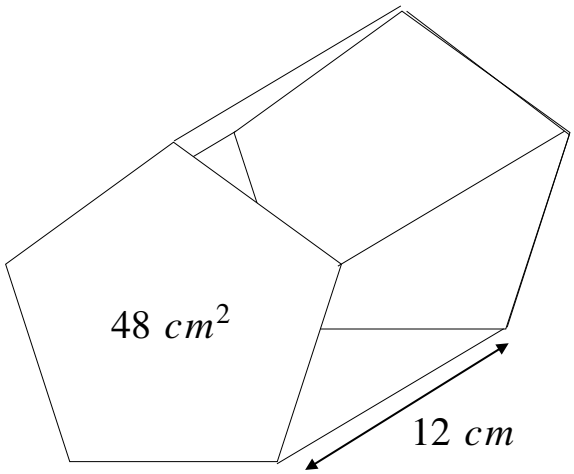
$0.5 \times 2 \times 1.5 = 1.5 m^3$

$1.5 m^3$

.....

(Total for Question 6 is 3 marks)

7. Work out the volume of the pentagonal prism.



48 × 12
= 576

576 ..... cm^3

(Total for Question 7 is 2 marks)

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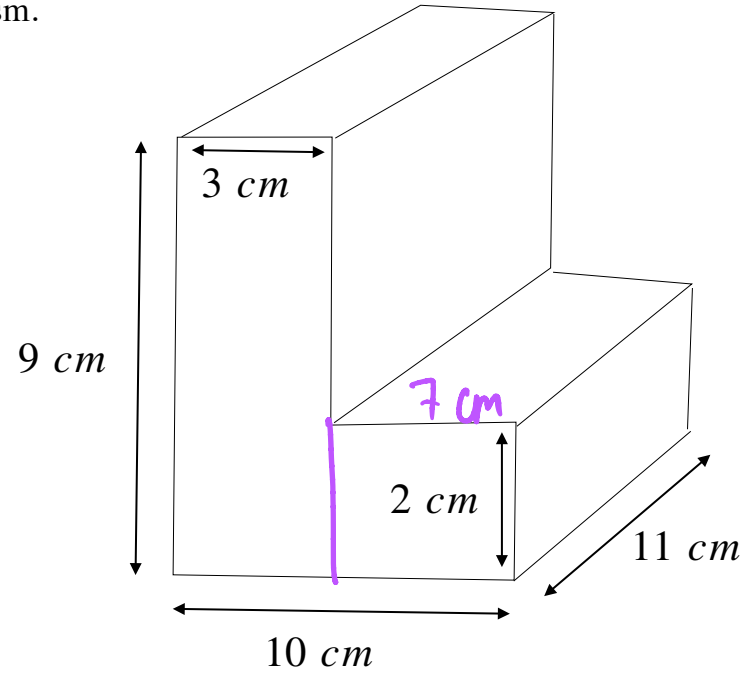
8. Work out the volume of the hexagonal prism.

2 × 7 × 11 = 154

3 × 9 × 11 = 297

154 + 297 = 451



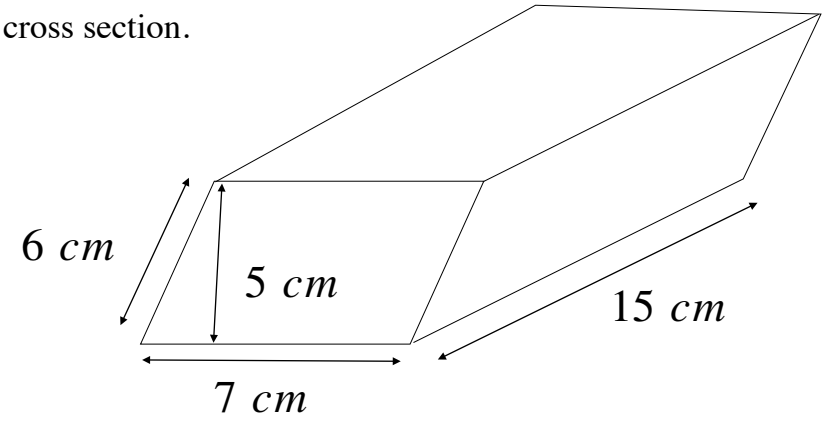
451 ..... cm^3

(Total for Question 8 is 3 marks)

9. Below is a prism with a parallelogram cross section.

Work out the volume of the prism.

$7 \times 5 \times 15 = 525$



525 ..... cm^3

(Total for Question 9 is 3 marks)

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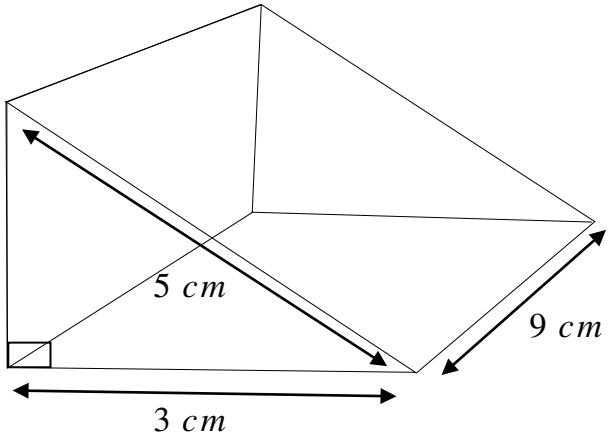
10. Work out the volume of the triangular prism.

$\sqrt{5^2 - 3^2} = 4$

4cm



$\frac{4 \times 3}{2} = 6$

$6 \times 9 = 54$

54 ..... cm^3

(Total for Question 10 is 4 marks)

11. A cuboid has a volume of 144 cm^3.

Its length is 8 cm and its width is 3 cm.

Work out the height of the cuboid.

$8 \times 3 \times h = 144$

$24h = 144$

$h = \frac{144}{24} = 6$

6 ..... *cm*

(Total for Question 11 is 3 marks)

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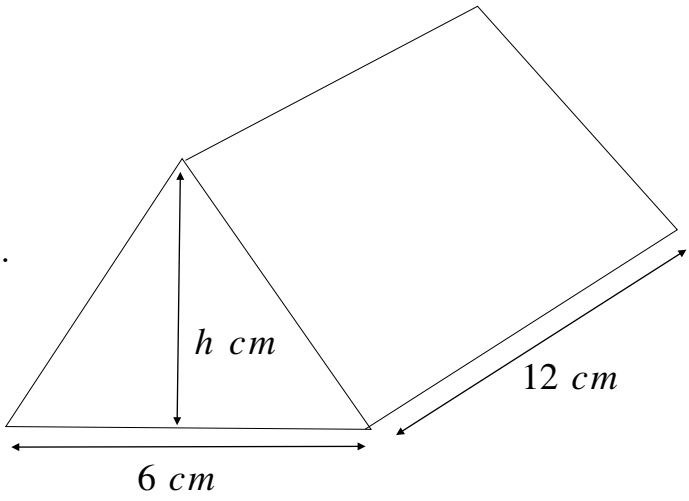
12. A triangular prism has a volume of 180 cm^3.

The length of the prism is 12 cm.

The base of the triangular cross-section is 6 cm.

Work out the height of the triangular cross-section.



$\frac{6 \times h}{2} \times 12 = 180$

$6 \times h \times 6 = 180$

$36h = 180$

$h = 5$

5 ..... *cm*

(Total for Question 12 is 3 marks)

13, A trapezium prism has a volume of 385 cm^3.

The area of its trapezium cross-section is 35 cm^2.

Work out the length of the prism.

$385 \div 35 = 11$

11 ..... *cm*

(Total for Question 13 is 2 marks)

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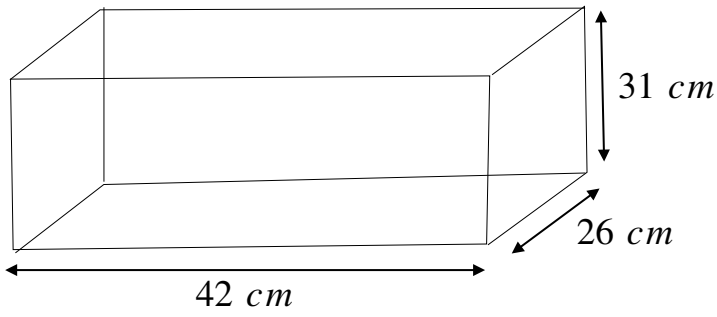
14. A fish tank is in the shape of a cuboid.



The tank is empty. Water is poured in at a rate of 500 cm^3 per minute.

Work out how many minutes it will take to fill the tank completely.

Give your answer to the nearest minute.

$42 \times 26 \times 31 = 33852\ cm^3$

$33852 \div 500 = 67.704$

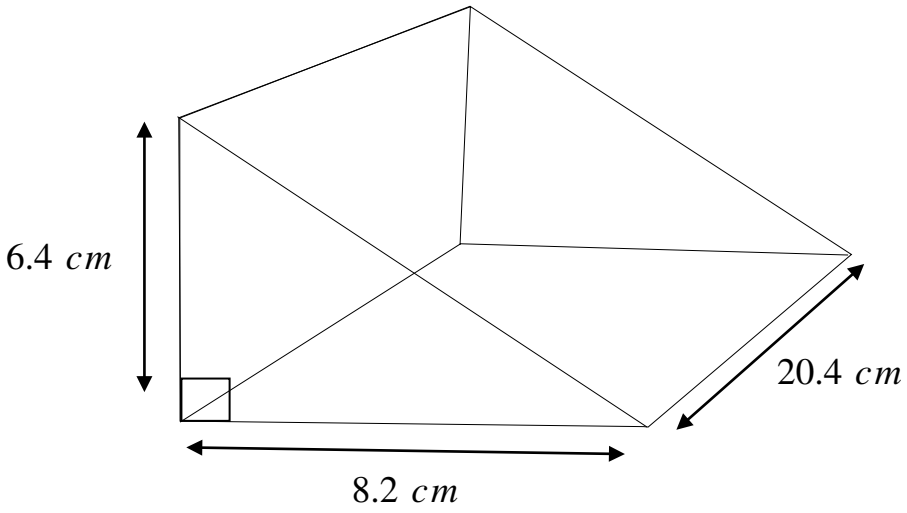
68 mins .....

(Total for Question 14 is 4 marks)

15. A container is in the shape of a triangular prism.

Water flows into the container at a rate of 240 cm^3 per minute.

How long does it take to fill the container? Give your answer in minutes and seconds.



$\frac{6.4 \times 8.2}{2} \times 20.4 = 535.296$

$535.296 \div 240 = 2.2304$

$= 2$ mins 14 seconds

2 mins 14 seconds

(Total for Question 15 is 4 marks)

16. A tank is in the shape of a prism.

The cross-sectional area of the tank is 325 cm^2.
The length of the tank is 74 cm.

The tank is $\frac{3}{5}$ full of water.

Water is added at a rate of 1.2 litres per minute.

Work out how long it takes for the tank to become completely full.

Give your answer in minutes and seconds.

Volume = 325 × 74

= 24050 cm^3

$\frac{3}{5}$ of 24050 = 14430 cm^3

So 24050 − 14430 = 9620 cm^3 left

1 litre = 1000 cm^3

So 9.62 litres left.

9.62 ÷ 1.2 = 8.0166 mins

= 8 mins 1 second.

8 mins 1 sec

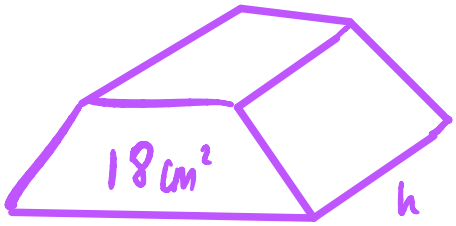
(Total for Question 16 is 4 marks)

17. A prism is made from a material with density 5 g/cm^3.

The prism has a trapezium cross-section with area 18 cm^2 and length h cm.

The mass of the prism is 900 g.

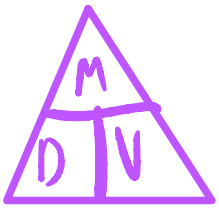
Calculate the value of h.



Volume = 18h cm^3

density = 5g / cm^3

mass = 900g



$M = D \times V$

$900 = 5 \times 18h$

$900 = 90h$

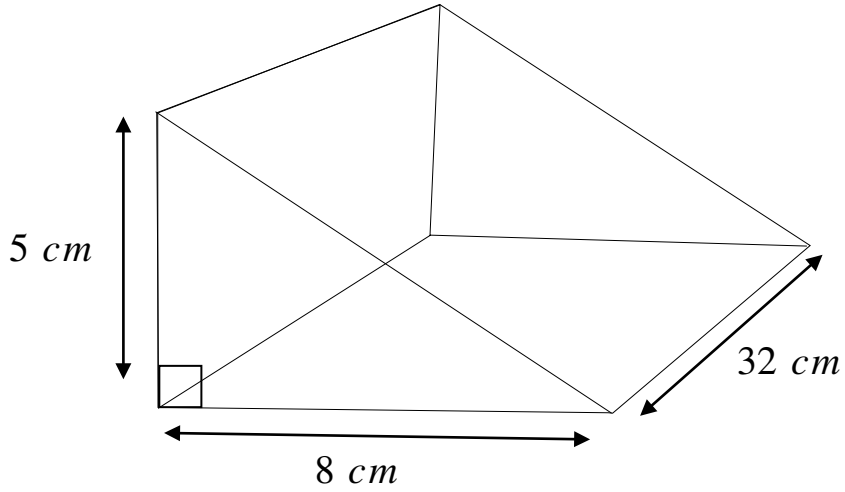
$h = 10$

10

.....

(Total for Question 17 is 2 marks)

18. The solid triangular prism below is made from wood.



(a) Calculate the volume of the prism.

$\frac{5 \times 8}{2} \times 32 = 640$

640 cm^3

(2)

The density of the wood is 0.6 g/cm³.

(b) The wood is cut into 5 identical smaller prisms of equal length.
Find the mass of one smaller prism.

$D = \frac{M}{V} \Rightarrow M = D \times V$

$640 \div 5 = 128\ cm^3$

mass $= 128 \times 0.6 = 76.8$ g

76.8 g

(2)

(Total for Question 18 is 4 marks)