Name: SOLUTIONS

GCSE (1 - 9)

Volume of a Prism

Buy me a coffee

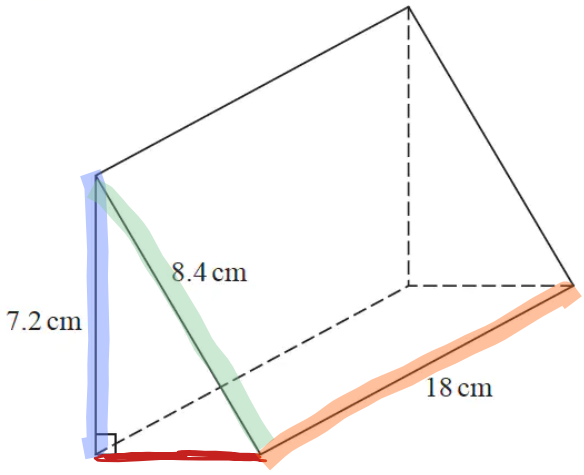
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These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***Summer 2023*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The ***most current*** version of these worksheets will always be available at: kennethstafford.co.uk

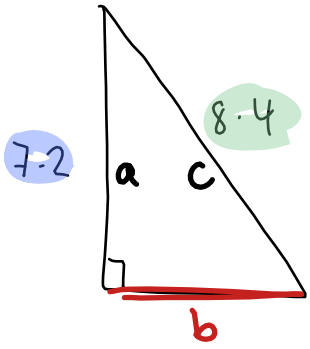
Question	Where the question appeared
1	Edexcel, GCSE, Summer 2018, Paper 2F, Q26
2	Edexcel, GCSE, Autumn 2020, Paper 1F, Q27
3	Edexcel, GCSE, Autumn 2020, Paper 3F, Q29
4	Edexcel, GCSE, Summer 2017, Paper 3F, Q12
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6	Edexcel, GCSE, Autumn 2017, Paper 1F, Q13
7	Edexcel, GCSE, Summer 2019, Paper 2F, Q23
8	Edexcel, GCSE, Autumn 2019, Paper 2F, Q29
9	Edexcel, GCSE, Autumn 2020, Paper 2F, Q11
10	Edexcel, GCSE, Autumn 2021, Paper 1F, Q25
11	Edexcel, GCSE, Summer 2023, Paper 2F, Q14
12	Edexcel, GCSE, November 2022, Paper 2F, Q11

1

Here is a triangular prism.



Work out the volume of the prism.
Give your answer correct to 3 significant figures.



$a^2+b^2=c^2$

$b^2=c^2-a^2$

$b^2=8.4^2-7.2^2$

$b^2=18.72$

$b=\sqrt{18.72}$

$b=4.327$

$$\frac{7.2 \times 4.327}{2} \times 18 = 280.367$$

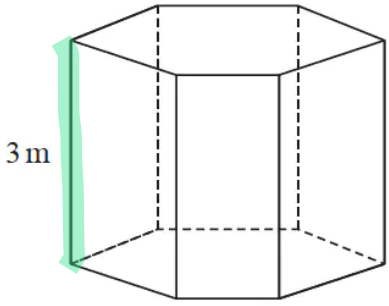
280 cm³

(Total for Question 26 is 5 marks)

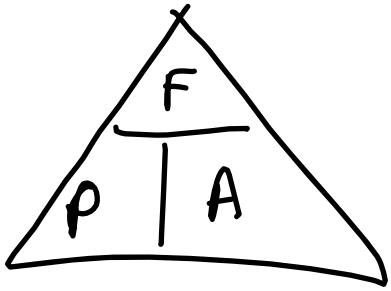
[Edexcel, GCSE, Summer 2018, Paper 2F, Q26]

2

The diagram shows a prism placed on a horizontal floor.



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$



The prism has height 3 m
The volume of the prism is 18 m³

The pressure on the floor due to the prism is 75 newtons/m²

Work out the force exerted by the prism on the floor.

$F = P \times A$

Area = $18 \div 3 = 6\ m^2$

Force = $75 \times 6 = 450\ N$

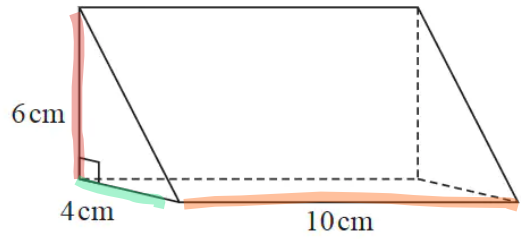
450 newtons

(Total for Question 27 is 3 marks)

[Edexcel, GCSE, Autumn 2020, Paper 1F, Q27]

3

The diagram shows a solid triangular prism.



The prism is made from wood with a density of 0.8 g/cm³

Work out the mass of this prism.

$$\text{Volume} = \frac{6 \times 4}{2} \times 10 = 120\text{cm}^3$$

$$\text{mass} = \text{Volume} \times \text{density}$$

$$= 120 \times 0.8$$

$$= 96\text{g}$$

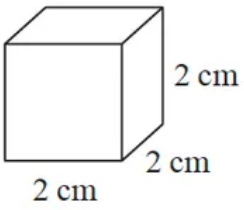
96 g

(Total for Question 29 is 3 marks)

[Edexcel, GCSE, Autumn 2020, Paper 3F, Q29]

4

The diagram shows a cube of side length 2 cm.



Vera says,

"The volume of any solid made with 6 of these cubes is 48 cm³"

(a) Is Vera correct?
You must show your working.

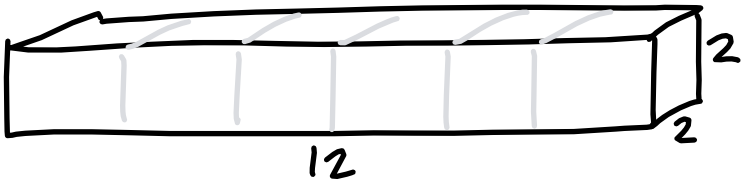
Volume of Cube = 2 x 2 x 2 = 8cm³

6 Solids = 6 x 8 = 48cm³

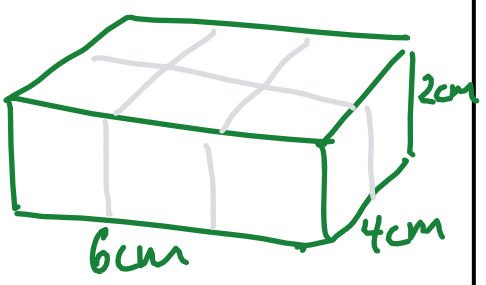
Yes. Vera is correct.

(2)

(b) (i) Draw a cuboid that can be made with 6 of these cubes.
Write the dimensions of the cuboid on your diagram.



or



(1)

(ii) Work out the surface area of your cuboid.

2 x 2x2 = 8
4 x 12x2 = 96
104cm²

or

2 x 4x2 = 16
2 x 6x2 = 24
2 x 6x4 = 48
88cm²

..... cm²

(2)

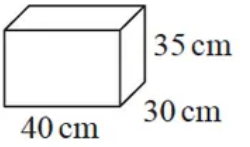
(Total for Question 12 is 5 marks)

[Edexcel, GCSE, Summer 2017, Paper 3F, Q12]

5

Chloe has a van.

She is going to use the van to deliver boxes.
Each box is a cuboid, 40 cm by 30 cm by 35 cm.



Box Volume
$0.4 \times 0.3 \times 0.35 = 0.042 m^3$

The space for boxes in the van has

maximum length	2.4 m
maximum width	1.5 m
maximum height	1.4 m

Capacity
$= 2.4 \times 1.5 \times 1.4 = 5.04 m^3$

The space for boxes is empty.
Chloe wants to put as many boxes as possible into the van.

She can put 3 boxes into the van in one minute.
Assume that the space for boxes is in the shape of a cuboid.

(a) Work out how many minutes it should take Chloe to put as many boxes as possible into the van.

Boxes in van = $5.04 \div 0.042 = 120$

Time taken = $120 \div 3 = 40$ minutes

40 minutes

(4)

The space for boxes might **not** be in the shape of a cuboid.

(b) Explain how this could affect the time it would take Chloe to put as many boxes as possible into the van.

The amount of time taken could be longer or shorter.

(1)

(Total for Question 16 is 5 marks)

[Edexcel, GCSE, Autumn 2017, Paper 3F, Q16]

6

The total surface area of a cube is 294 cm^2.

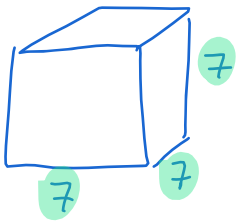
Work out the volume of the cube.

6 faces = 294

÷6 ↓ 1 face = 49 ↓ ÷6

edge = $\sqrt{49}$ = 7

Volume = 7^3 = 343 cm^3



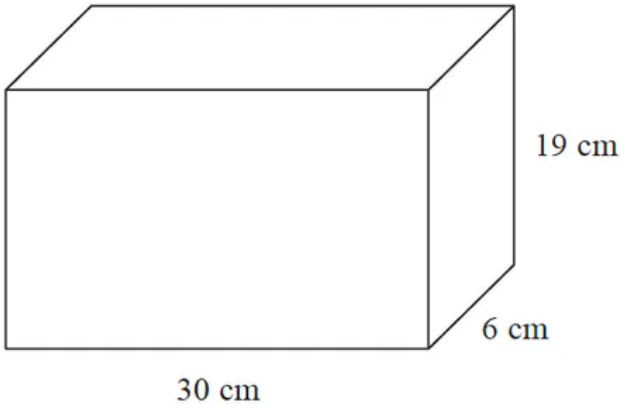
343 cm³

(Total for Question 13 is 4 marks)

[Edexcel, GCSE, Autumn 2017, Paper 1F, Q13]

7

A container is in the shape of a cuboid.



The container is $\frac{2}{3}$ full of water.

A cup holds 275 m*l* of water.

Capacity = 30 x 6 x 19 = 3420cm³

What is the greatest number of cups that can be completely filled with water from the container?

3420 x 2/3 = 2280cm³

2280cm³ = 2280mL

2280 ÷ 275 = 8.3 cups

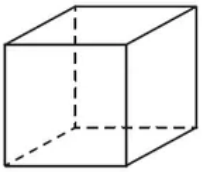
8

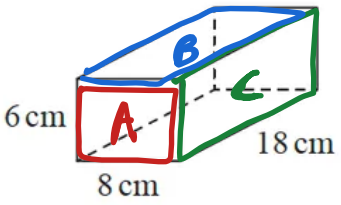
(Total for Question 23 is 4 marks)

[Edexcel, GCSE, Summer 2019, Paper 2F, Q23]

8

The diagram shows a cube and a cuboid.





A = 6 x 8 = 48
B = 8 x 18 = 144
C = 6 x 18 = 108
300
x 2
= 600cm²

The total surface area of the cube is equal to the total surface area of the cuboid.

Janet says,

"The volume of the cube is equal to the volume of the cuboid."

Is Janet correct?
You must show how you get your answer.

Surface Area of Cuboid = $600cm^2$

Surface Area of Cube = $600cm^2$

6 faces = 600

1 face = 100

edge = $\sqrt{100} = 10$

Volume of Cube = $10^3 = 1000cm^3$

Volume of Cuboid = $6 \times 8 \times 18 = 864cm^3$

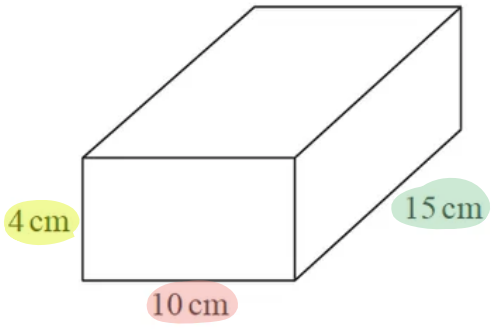
No Volumes are <u>not</u> equal.

(Total for Question 29 is 5 marks)

[Edexcel, GCSE, Autumn 2019, Paper 2F, Q29]

9

Here is a cuboid.



Work out the volume of the cuboid.

worth 1 mark

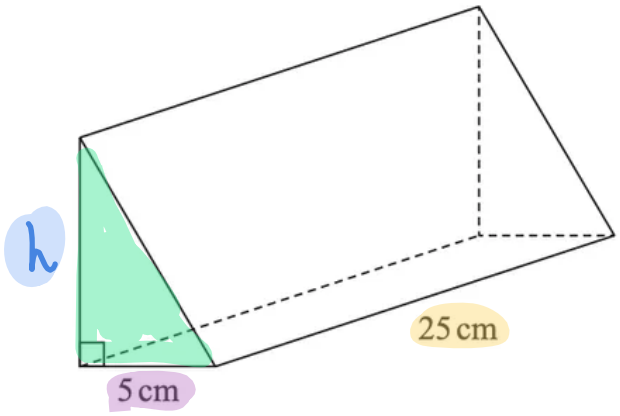
$4 \times 10 \times 15 =$ 600 cm^3

(Total for Question 11 is 3 marks)

[Edexcel, GCSE, Autumn 2020, Paper 2F, Q11]

10

The diagram shows a prism.



The cross section of the prism is a right-angled triangle.
The base of the triangle has length 5 cm

The prism has length 25 cm
The prism has volume 750 cm^3

$750 \div 25 = 30$ (Area of triangle)

Work out the height of the prism.

$\frac{5h}{2} = 30$

$5h = 60$

$h = 12$

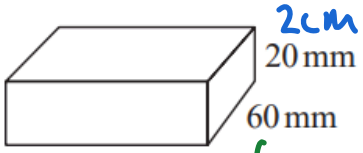
12 ..... cm

(Total for Question 25 is 3 marks)

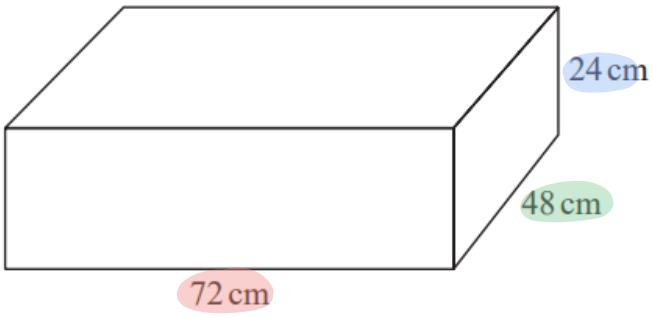
[Edexcel, GCSE, Autumn 2021, Paper 1F, Q25]

11

Packets of sweets are put into boxes.



Packet



Box

Each packet is a cuboid, 80 mm by 60 mm by 20 mm.
Each box is a cuboid, 72 cm by 48 cm by 24 cm.

Work out the greatest number of packets that can be put into each box.

72 ÷ 8 = 9
48 ÷ 6 = 8
24 ÷ 2 = 12

9 x 8 x 12 = 864

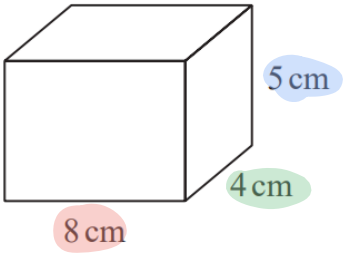
864

(Total for Question 14 is 4 marks)

[Edexcel, GCSE, Summer 2023, Paper 2F, Q14]

12

Here is a cuboid.



Work out the volume of the cuboid.

8 x 4 x 5 = 160 ..... cm^3

(Total for Question 11 is 2 marks)

[Edexcel, GCSE, November 2022, Paper 2F, Q11]