Name: SOLUTIONS

GCSE (1 - 9)

Surface Area

Buy me a coffee

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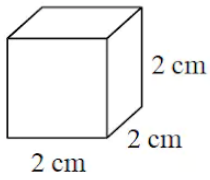
These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***Summer 2023*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The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

Question	Where the question appeared
1	Edexcel, GCSE, Summer 2017, Paper 3F, Q12
2	Edexcel, GCSE, Autumn 2017, Paper 1F, Q13
3	Edexcel, GCSE, Summer 2018, Paper 1F, Q23
4	Edexcel, GCSE, Summer 2019, Paper 3F, Q29
5	Edexcel, GCSE, Autumn 2019, Paper 2F, Q29
6	Edexcel, GCSE, Summer 2022, Paper 1H, Q9
7	Edexcel, GCSE, Summer 2023, Paper 1F, Q22

Surface Area Questions from Past Papers

1

The diagram shows a cube of side length 2 cm.



Volume = 2x2x2 = 2^3
= $8cm^3$

Vera says,

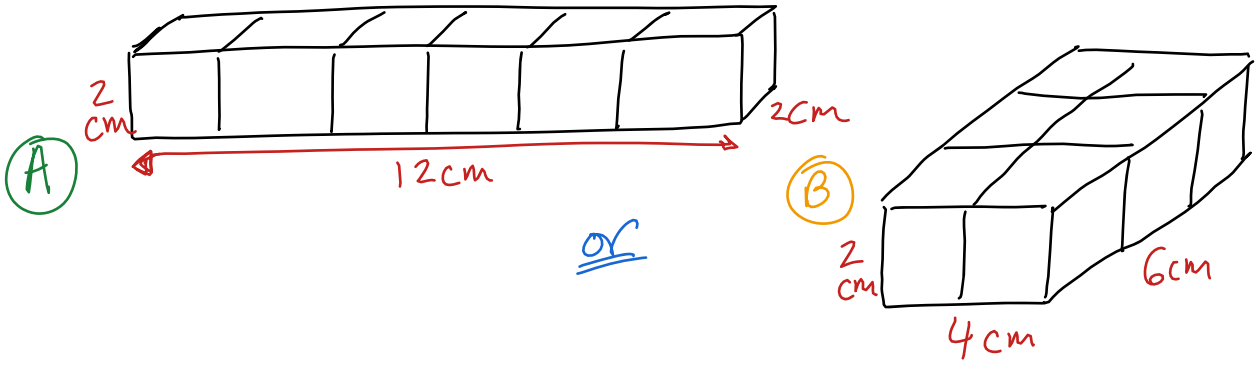
"The volume of any solid made with 6 of these cubes is 48 cm^3"

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

Yes. 8 x 6 = 48 cm^3

(2)

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



(1)

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

A [2x2] x2 = 4x2 = 8
[12x2] x4 = 24x4 = 96
104 cm^2

B [2x4] x2 = 8x2 = 16
[2x6] x2 = 12x2 = 24
[4x6] x2 = 24x2 = 48
88 cm^2

..... cm^2

(2)

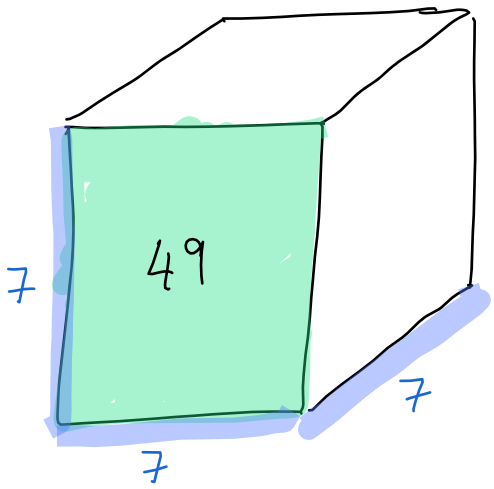
(Total for Question 12 is 5 marks)

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

2

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

Work out the volume of the cube.



$294 \div 6 = 49$ (one face)

$\sqrt{49} = 7$

Vol $= 7 \times 7 \times 7 = 7^3 = 343 cm^3$

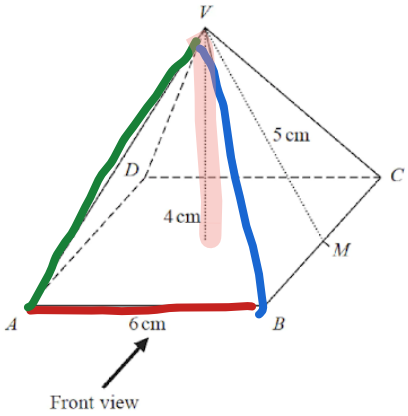
343 ..... cm^3

(Total for Question 13 is 4 marks)

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

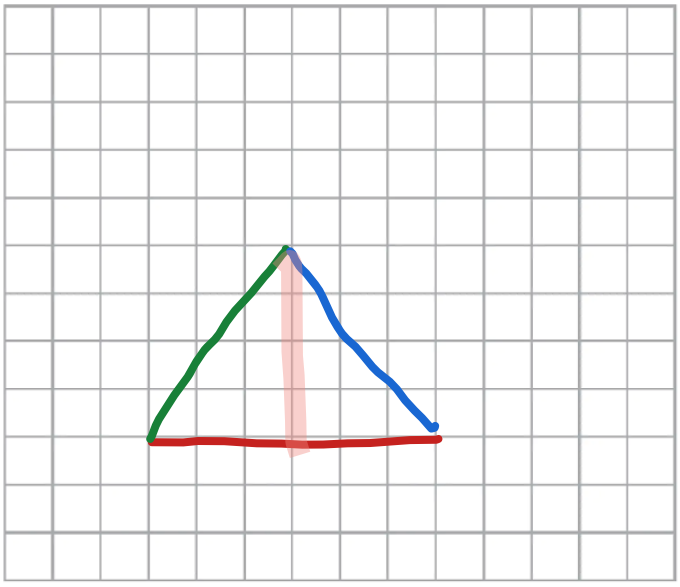
3

Here is a solid square-based pyramid, $VABCD$.



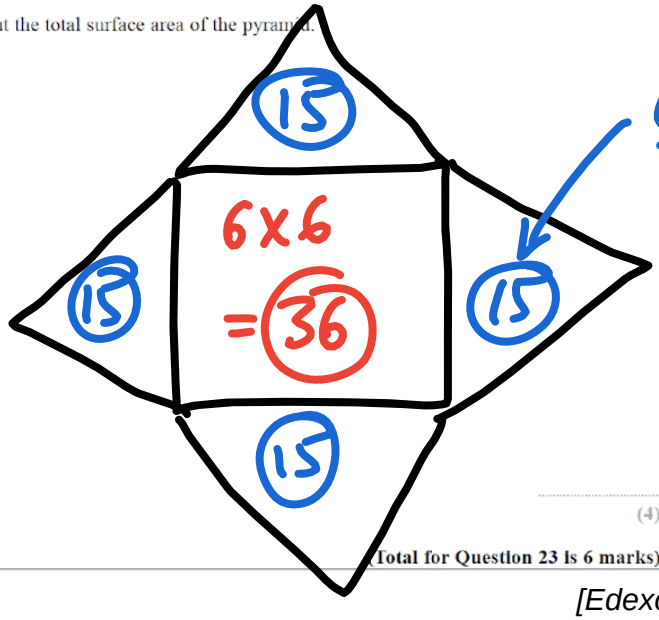
The base of the pyramid is a square of side 6 cm.
The height of the pyramid is 4 cm.
M is the midpoint of BC and $VM = 5$ cm.

(a) Draw an accurate front elevation of the pyramid from the direction of the arrow.



(2)

(b) Work out the total surface area of the pyramid.



$\frac{6 \times 5}{2} = \frac{30}{2} = 15$

$36 + (15 \times 4)$

$= 96\text{cm}^2$

(4)

(Total for Question 23 is 6 marks)

[Edexcel, GCSE, Summer 2018, Paper 1F, Q23]

$r = 0.8\text{m}$ $d = 1.6\text{m}$

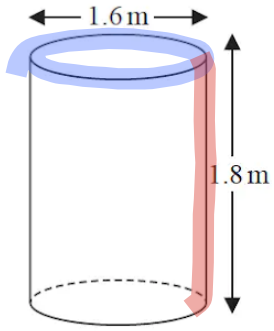
4

Jeremy has to cover 3 tanks completely with paint.

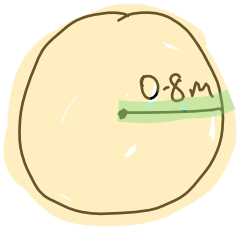
Each tank is in the shape of a cylinder with a top and a bottom.
The tank has a diameter of 1.6 m and a height of 1.8 m.

Jeremy has 7 tins of paint.
Each tin of paint covers 5 m^2

Has Jeremy got enough paint to cover completely the 3 tanks?
You must show how you get your answer.



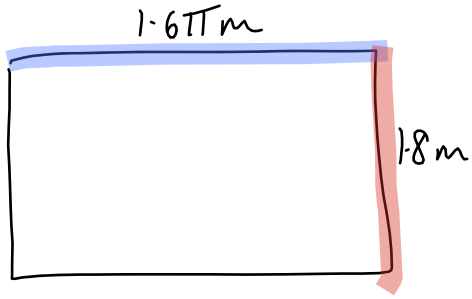
$\text{Area} = \pi r^2$



$\text{Area} = \pi \times 0.8^2 = 2.01 m^2$

$\text{Circumference} = \pi \times \text{diameter}$

$\text{Circumference} = 1.6 \times \pi = 1.6\pi m$



$\text{Area} = 1.6\pi \times 1.8m = 9.05 m^2$

$\text{Surface Area} = 2.01 + 2.01 + 9.05 = 13.07 m^2$

$3 \text{ tanks} = 13.07 \times 3 = 39.2 m^2$

$7 \text{ tins of paint} = 7 \times 5 = 35 m^2$

$39.2 > 35$

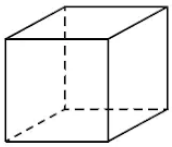
No. He does not have enough paint.

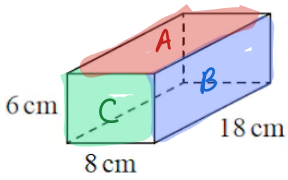
(Total for Question 29 is 5 marks)

[Edexcel, GCSE, Summer 2019, Paper 3F, Q29]

5

The diagram shows a cube and a cuboid.





$A = 8 \times 18 = 144$
$B = 6 \times 18 = 108$
$C = 6 \times 8 = 48$
$300 \times 2 = 600 cm^2$

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

Janet says,

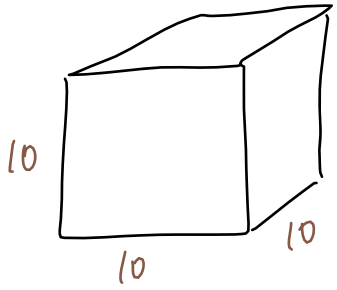
"The volume of the cube is equal to the volume of the cuboid."

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

S. Area of cuboid = $600 cm^2$

Vol of cuboid = $6 \times 8 \times 18 = 864 cm^3$

S. Area of cube = $600 cm^2$



$\frac{600}{6} = 100$

$\sqrt{100} = 10$

Vol of cube = $10 \times 10 \times 10 = 10^3$
$= 1000 cm^3$

$1000 > 864$

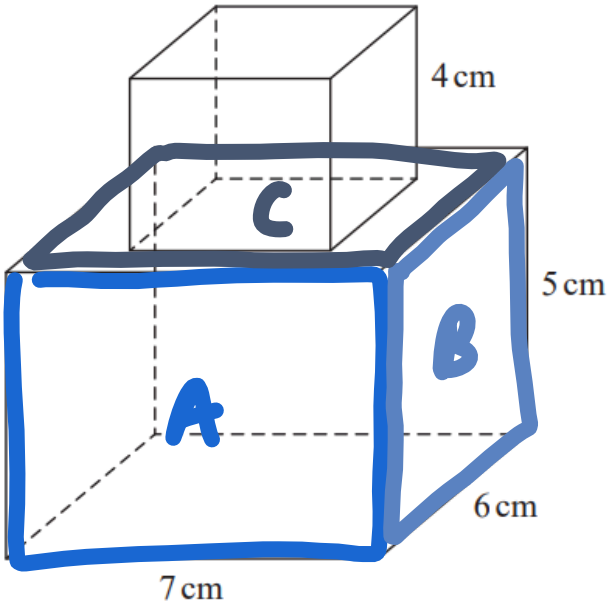
No. Janet is not correct.

(Total for Question 29 is 5 marks)

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

6

A cube is placed on top of a cuboid, as shown in the diagram, to form a solid.



The cube has edges of length 4 cm.
The cuboid has dimensions 7 cm by 6 cm by 5 cm.

Work out the total surface area of the solid.

Surface area of Cube = $4^2 \times 5 = 80 cm^2$ (one side not exposed)

Surface area of cuboid =
A = 7 x 5 = 35
B = 5 x 6 = 30
C = 7 x 6 = 42
107 x 2 = 214

214 − 16 = 198

198 + 80 = 278

..... cm²

(Total for Question 9 is 3 marks)

[Edexcel, GCSE, Summer 2022, Paper 1H, Q9]

7

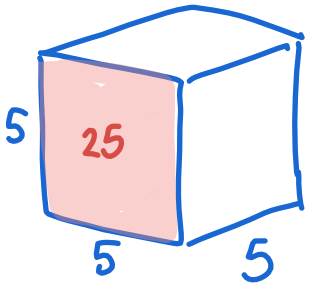
A cube has a total surface area of $150\,cm^2$

Work out the volume of the cube.

6 faces = 150

1 face = 25

1 side = $\sqrt{25} = 5$



Volume = $5^3 = 5 \times 5 \times 5 = 125\,cm^3$

125 ..... cm^3

(Total for Question 22 is 4 marks)

[Edexcel, GCSE, Summer 2023, Paper 1F, Q22]