

Area & Volume of Similar Shapes

Question Paper

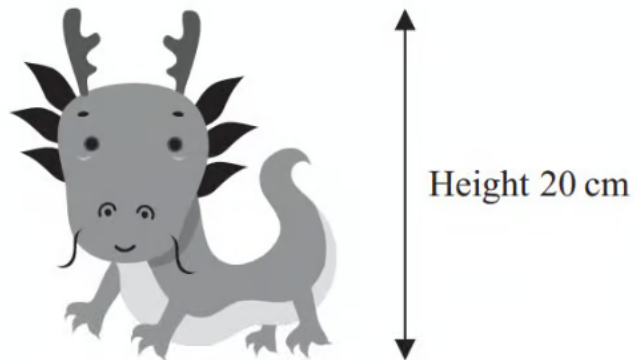
Course	Edexcel IGCSE Maths
Section	4. Geometry & Trigonometry
Topic	Area & Volume of Similar Shapes
Difficulty	Medium

Time allowed: 60
Score: /45
Percentage: /100

Question 1

A company makes monsters.

The company makes small monsters with a height of 20 cm.



A small monster has a surface area of 300 cm^2 .

The company also makes large monsters with a height of 120 cm.

A small monster and a large monster are mathematically similar.

Work out the surface area of a large monster.

[3 marks]

Question 2a

The diagram shows two similar solids, *A* and *B*.

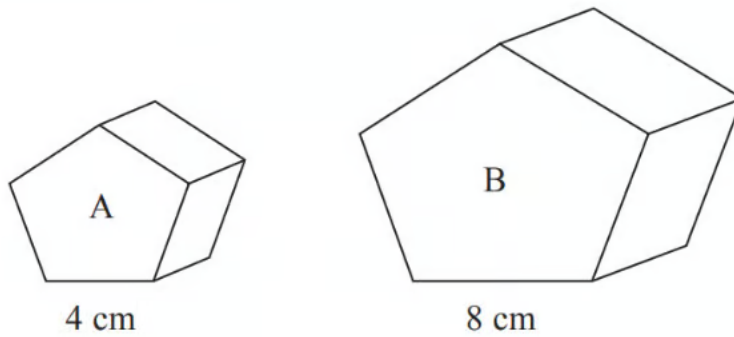


Diagram **NOT**
accurately drawn

Solid A has a volume of 80 cm^3 .

Work out the volume of solid B.

[2 marks]

Question 2b

Solid B has a total surface area of 160 cm^2 .

Work out the total surface area of solid A.

[2 marks]

Question 3a

A and **B** are two similar vases.

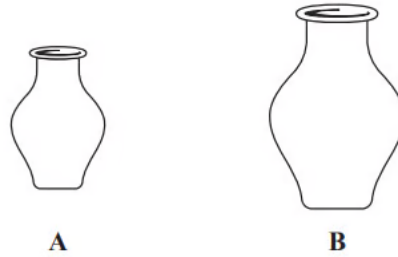


Diagram **NOT**
accurately drawn

Vase **A** has height 24 cm.

Vase **B** has height 36 cm.

Vase **A** has a surface area of 960 cm^2

Work out the surface area of vase **B**.

..... cm^2

[2 marks]

Question 3b

Vase **B** has a volume of $V \text{ cm}^3$

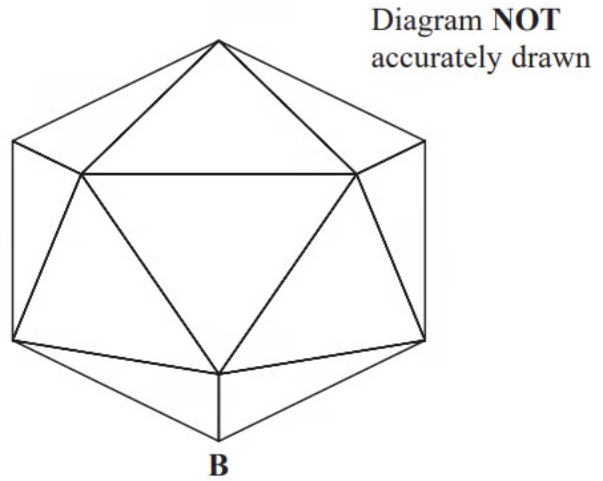
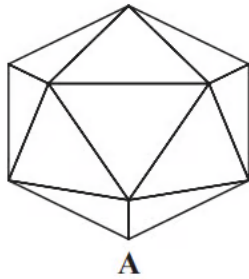
Find in terms of V , an expression for the volume, in cm^3 , of vase **A**.

..... cm^3

[2 marks]

Question 4

A and **B** are two similar solids.



A has a volume of 1836 cm^3

B has a volume of 4352 cm^3

B has a total surface area of 1120 cm^2

Work out the total surface area of **A**.

..... cm^2

[3 marks]

Question 5

R and **S** are two similar solid shapes.

Shape **R** has surface area 108 cm^2 and volume 135 cm^3

Shape **S** has surface area 300 cm^2

Work out the volume of shape **S**.

..... cm^3

[3 marks]

Question 6

Mathematically similar wooden blocks are made in a workshop.

There are small blocks and there are large blocks.

The volume of each small block is 300cm^3

Given that the surface area of each small block : the surface area of each large block = 25 : 36

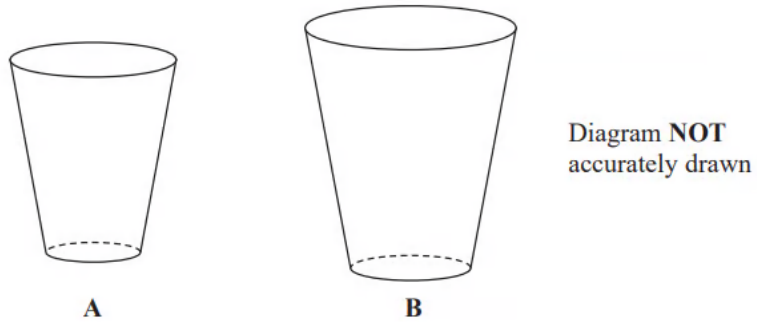
work out the volume of each large block.

..... cm^3

[3 marks]

Question 7

The diagram shows two mathematically similar vases, **A** and **B**.



A has a volume of 405cm^3

B has a volume of 960cm^3

B has a surface area of 928cm^2

Work out the surface area of **A**.

[3 marks]

Question 8

The diagram shows two similar bottles, **A** and **B**.



Diagram **NOT** accurately drawn

Bottle **A** has surface area 240 cm^2

Bottle **B** has surface area 540 cm^2 and volume 2025 cm^3

Work out the volume of bottle **A**.

..... cm^3

[3 marks]

Question 9

A and B are similar solid cylinders.

base area of A : base area of B = 9 : 25
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Complete these ratios.

curved surface area of A : curved surface area of B = :

height of A : height of B = :

[2 marks]

Question 10

A and B are similar cuboids.

surface area of A : surface area of B = 16 : 25

Work out volume of A : volume of B

Circle your answer.

4 : 5

16 : 25

64 : 125

256 : 625

[1 mark]

Question 11

Solids X and Y are similar.

X has volume 64 cm^3

Y has volume 343 cm^3

The surface area of X is 176 cm^2

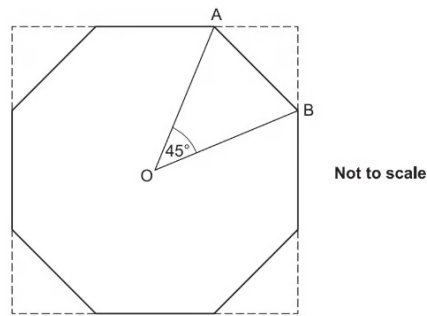
Work out the surface area of Y.

..... cm^2

[3 marks]

Question 12

Simon cuts the corners off a square piece of card to leave the regular octagon shown below.



Simon makes a table top using the card as a model.

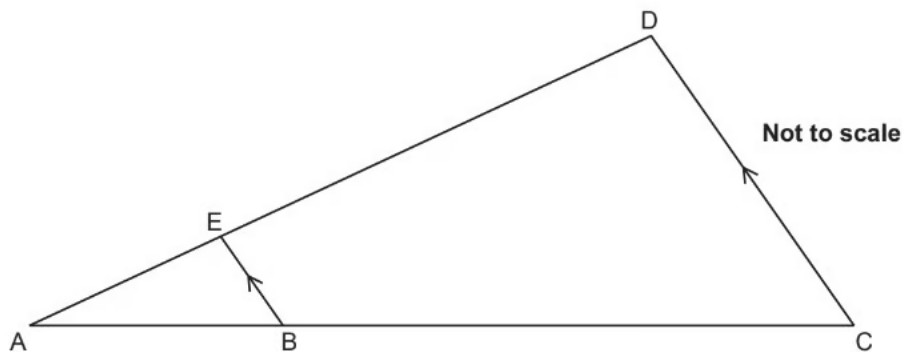
The sides of the table top are 8 times as long as the sides of the card model.

Find the ratio of the **area** of Simon's table top to the **area** of the card model.

[2 marks]

Question 13

In the diagram, AED and ABC are straight lines and BE is parallel to CD.



The ratio of length AB to length BC is 2 : 3.

Triangle ABE has an area of 8cm^2

Work out the area of triangle ACD.

..... cm^2

[4 marks]

Question 14

A transport lorry consists of a cab and a trailer.
The trailer has a volume of 90m^3 .
Alfie makes a model of this lorry using a scale of 1 : 72.

Work out the volume of the trailer in Alfie's model, giving your answer in cm^3 .

..... cm^3

[3 marks]

Question 15

Toy building bricks are available in two sizes, small and large.
The small and large bricks are mathematically similar.
A small brick has volume 8cm^3 and width 2.1cm.
A large brick has volume 15.625cm^3 .
Calculate the width of a large brick.

..... cm

[4 marks]

