Area & Volume of Similar Shapes

Question Paper

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

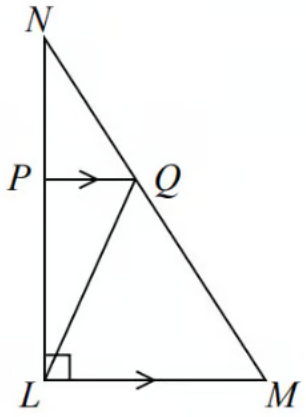
Time allowed: 50

Score: /37

Percentage: /100

Question 1

LMN is a right-angled triangle.



Angle NLM = 90°
PQ is parallel to LM.

The area of triangle PNQ is 8 cm^2
The area of triangle LPQ is 16 cm^2

Work out the area of triangle LQM.

[4 marks]

Question 2

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

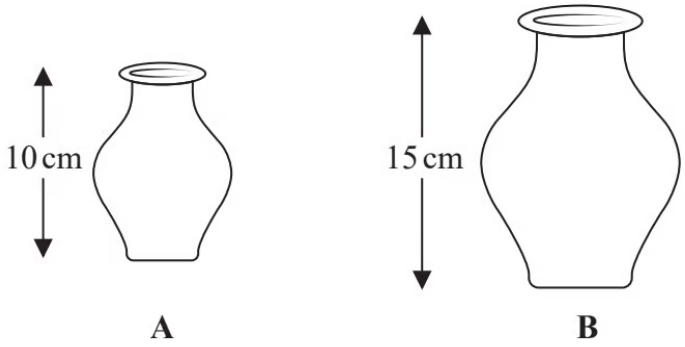


Diagram **NOT** accurately drawn

Vase **A** has height 10 cm.
Vase **B** has height 15 cm.

The difference between the volume of vase **A** and the volume of vase **B** is 1197 cm^3

Calculate the volume of vase **A**

..... cm^3

[4 marks]

Question 3

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

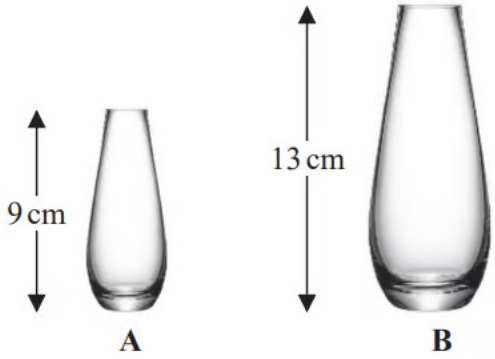


Diagram **NOT** accurately drawn

The height of vase **A** is 9cm and the height of vase **B** is 13 cm.

Given that

surface area of vase **A** + surface area of vase **B** = 1800 cm^2

calculate the surface area of vase **A**.

..... cm^2

[4 marks]

Question 4

The total surface area of a solid hemisphere is equal to the curved surface area of a cylinder.

The radius of the hemisphere is r cm.
The radius of the cylinder is twice the radius of the hemisphere.

Given that

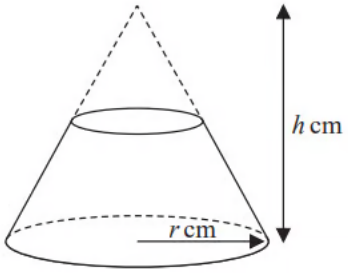
$$\text{volume of hemisphere} : \text{volume of cylinder} = 1 : m$$

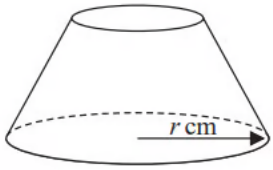
find the value of m.

[4 marks]

Question 5

A frustum is made by removing a small cone from a large cone.
The cones are mathematically similar.





Frustum

Diagram **NOT** accurately drawn

The large cone has base radius r cm and height h cm.
Given that

$$\frac{\text{volume of frustum}}{\text{volume of large cone}} = \frac{98}{125}$$

find an expression, in terms of h, for the height of the frustum.

..... cm

[4 marks]

Question 6

A standard tin and a large tin are mathematically similar.
The **volume** of the large tin is 50% more than the volume of the standard tin.
Both tins are cylinders.
The radius of the standard tin is 10cm.

Calculate the radius of the large tin.

..... cm

[4 marks]

Question 7

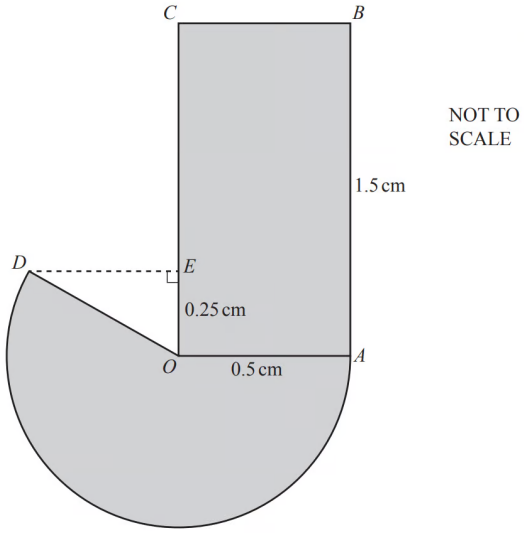
The area of pentagon *A* is $73.5\ \text{cm}^2$.
The area of pentagon *B* is $6\ \text{cm}^2$.

Find the ratio perimeter of pentagon *A* : perimeter of pentagon *B* in its simplest form.

..... : .....

[2 marks]

Question 8a



The diagram shows a company logo made from a rectangle and a major sector of a circle.
The circle has centre O and radius OA.
$OA = OD = 0.5$ cm and $AB = 1.5$ cm.
E is a point on OC such that $OE = 0.25$ cm and angle $OED = 90°$.

Calculate the perimeter of the logo.

..... cm

[5 marks]

Question 8b

Calculate the area of the logo.

..... cm^2

[3 marks]

Question 8c

A mathematically similar logo is drawn.
The area of this logo is 77.44 cm^2.

Calculate the radius of the major sector in this logo.

..... cm

[3 marks]