3.2 Geometry of 3D Shapes

Question Paper

Course	DP IB Maths
Section	3. Geometry & Trigonometry
Topic	3.2 Geometry of 3D Shapes
Difficulty	Medium

Time allowed: 50

Score: /39

Percentage: /100

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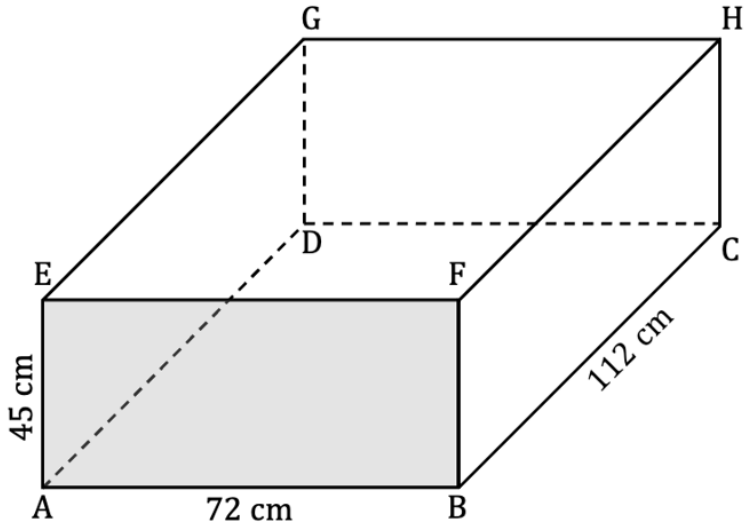
Question 1a

The diagram below shows a cuboid measuring 45 cm × 72 cm × 112 cm.



(a) (i) Calculate the distance from A to F.

(ii) Calculate the distance from B to H.

(iii) Calculate the distance from A to C.

[3 marks]

Question 1b

(b) Calculate the distance from B to G.

[2 marks]

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Question 2a

A nickel earring in the shape of a sphere has a radius of 4mm.

(a) Find the volume of the earring, expressing your answer in the form of $a \times 10^k$, where $1 \leq a \leq 10$ and k is an integer.

[3 marks]

Question 2b

The nickel earring is to be melted down and reshaped to form a cylinder with a height of 16mm.

(b) Find the radius of the cylinder.

[2 marks]

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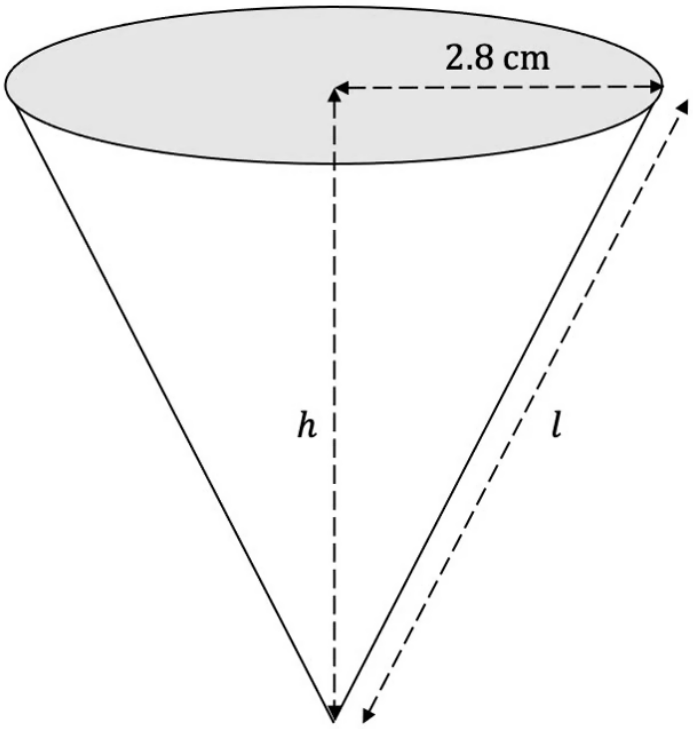
Question 3a

A waffle ice cream cone forms a right circular cone that has a volume of 120 cm^3 and a radius of 2.8 cm.



(a) Find the height, h, of the cone.

[2 marks]

Question 3b

(b) Find the slant height, l, of the cone.

[2 marks]

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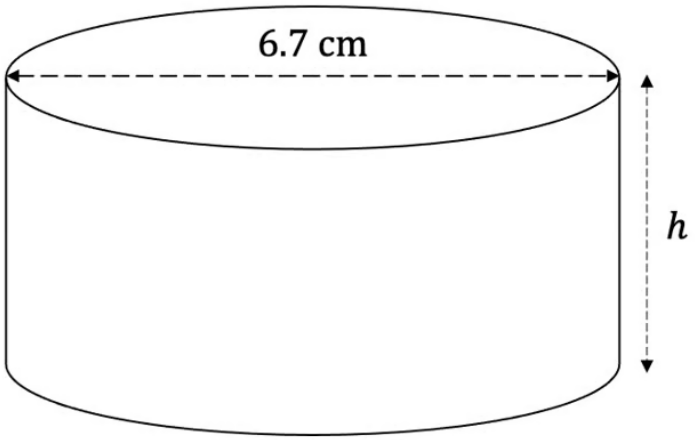
Question 3c

(c) Calculate the curved surface area of the cone.

[2 marks]

Question 4a

A baking container has the shape of a cylinder, as shown in the diagram below. The diameter of the baking container is 6.7 cm and its volume, V, is 80 cm^3.



(a) Find the height, h, of the baking container.

[2 marks]

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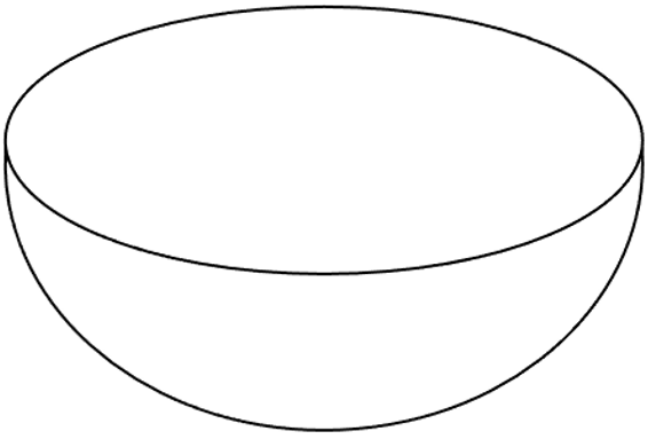
Question 4b

A bowl full of cake batter has the shape of a hemisphere, as shown in the diagram below. The cake batter is poured into the baking container and fills a quarter of the container.



(b) Find the radius, r, of the bowl.

[4 marks]

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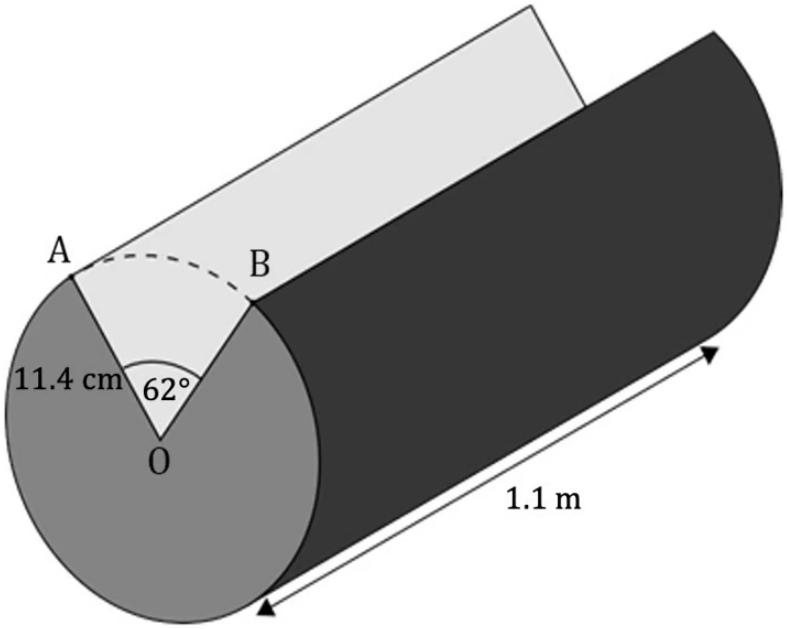
Question 5a

Hamish is building a tree hut using cylindrical logs of length 1.1m and radius 11.4cm.
A wedge is cut from the logs as shown.



(a) Find the length, in cm, of the

(i) minor arc AB

(ii) major arc AB.

[3 marks]

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Question 5b

(b) Find the area of the empty sector OAB.

[2 marks]

Question 5c

(c) Find the volume of each log. Give your answer in cm^3.

[3 marks]

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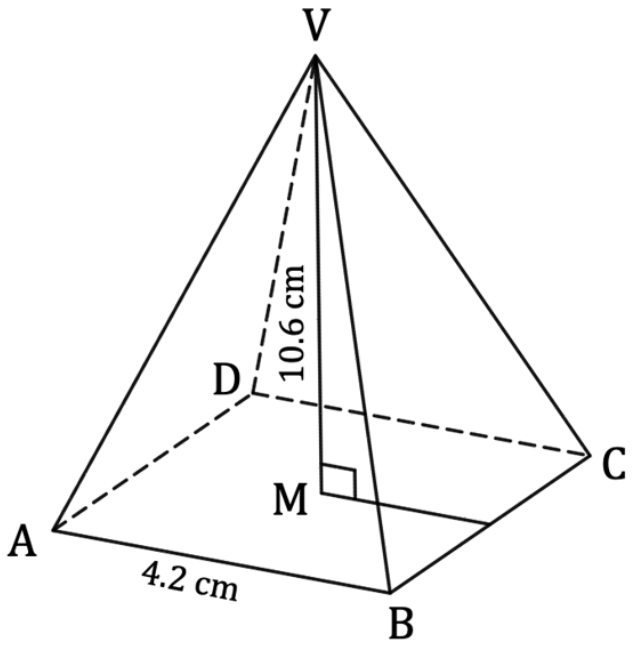
Question 6a

In the diagram below ABCD is the square base of a right pyramid with vertex V. The centre of the base is M. The sides of the square base are 4.2 cm and the vertical height is 10.6 cm.



(a) Calculate the area of the triangle ABV.

[3 marks]

Question 6b

(b) Calculate the length of AV.

[3 marks]

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Question 6c

(c) Find the size of the angle AV makes with the square base ABCD.

[3 marks]

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