IGCSE – Volume/Surface Area/ Mass - 1

Oct 04 Paper 4

6

NOT TO SCALE

13 cm

7 cm
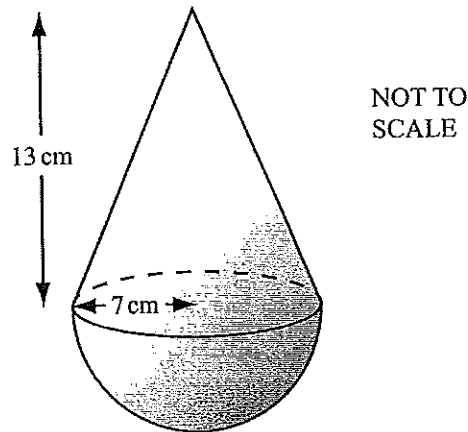
The diagram shows a solid made up of a hemisphere and a cone.
The base radius of the cone and the radius of the hemisphere are each 7 cm.
The height of the cone is 13 cm.

(a) **(i)** Calculate the total volume of the solid.

[The volume of a hemisphere of radius r is given by $V = \frac{2}{3}\pi r^3$.]

[The volume of a cone of radius r and height h is given by $V = \frac{1}{3}\pi r^2 h$.] [2]

(ii) The solid is made of wood and 1 cm³ of this wood has a mass of 0.94 g.
Calculate the mass of the solid, in kilograms, correct to 1 decimal place. [3]

(b) Calculate the curved surface area of the cone.
[The curved surface area of a cone of radius r and sloping edge l is given by $A = \pi r l$.] [3]

(c) The cost of covering all the solid with gold plate is $411.58.
Calculate the cost of this gold plate per square centimetre.

[The curved surface area of a **hemisphere** is given by $A = 2\pi r^2$.] [5]

May 06 Paper 4
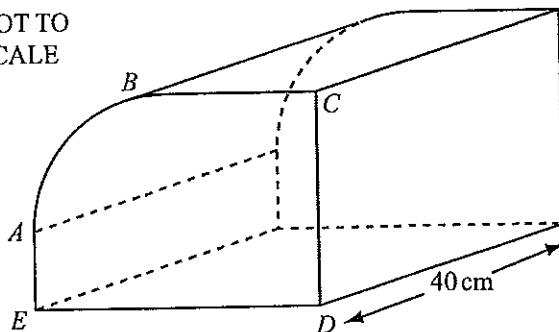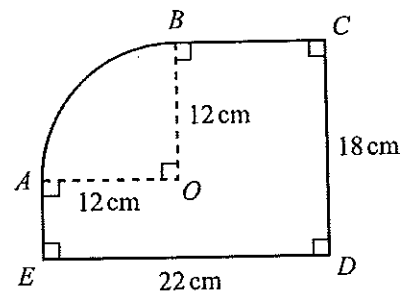
2

NOT TO SCALE

Diagram 1

Diagram 2

Diagram 1 shows a closed box. The box is a prism of length 40 cm.
The cross-section of the box is shown in Diagram 2, with all the right-angles marked.
AB is an arc of a circle, centre O, radius 12 cm.
$ED = 22$ cm and $DC = 18$ cm.

Calculate

(a) the perimeter of the cross-section, [3]
(b) the area of the cross-section, [3]
(c) the volume of the box, [1]
(d) the **total** surface area of the box. [4]