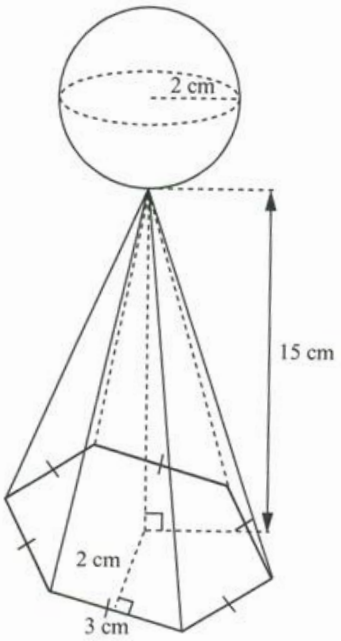
Class Test 4

40

Answer all questions. Show your working clearly.

1.



A trophy has a right regular hexagonal pyramid base and a sphere on top.

(a) Find the total volume of metal needed to create the trophy. [3]

(b) The trophy is gold-plated, excluding its base. If it costs 37¢ per cm^2, find the total cost of gold-plating the trophy. [3]

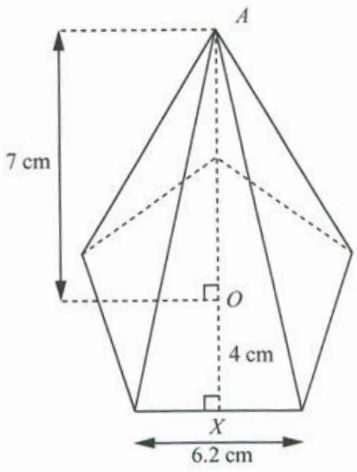
2. A hemispherical bowl of external radius 12 cm has a thickness of 1.5 cm.

(a) Find the capacity of the hemispherical bowl, in terms of litres. [1]

(b) The surface is covered with lacquer. It costs 7¢ to lacquer 1 cm^2 of the surface. Find the cost of lacquering. [3]

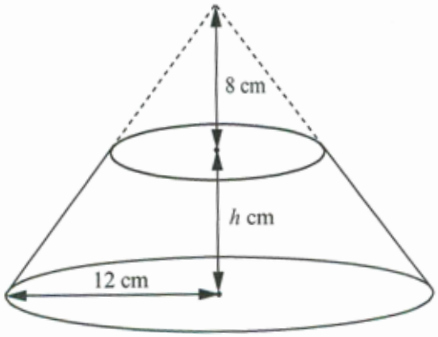
3. A right square pyramid with a base of side 12 cm is melted to form 32 identical cylindrical rods, with radius 1 cm and length 10.5 cm.
   (a) Find the height of the pyramid. [3]
   (b) Find the difference between the total surface area of all 32 rods and the total surface area of the pyramid, leaving your answer correct to 1 decimal place. [4]

4.



The figure shows a right pyramid with a pentagonal base.
(a) Find the volume of the pyramid. [2]
(b) (i) Calculate the slant height, AX. [1]
(ii) Find the total surface area of the pyramid. [2]

5.



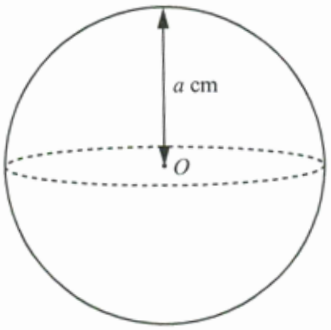
The figure above shows a frustum. The radius of the upper part is $\frac{1}{2}$ of the radius of the base.

(a) Find the value of h. [1]

(b) Find the volume of the frustum. [1]

(c) Find the total surface area of the frustum. [3]

6.



O is the centre of the sphere. The surface area of the sphere is 1430 cm^2.

(a) Find the value of a. [1]

(b) Find the volume of the sphere. [1]

7. The height of an ice cream cone is 5 times its radius.
   (a) The cone can contain 43.12 cm^3 of ice cream. Find its height. [3]
   (b) The slant height of the cone is 7.15 cm. If the external curved surface of the cone is covered with paper, find the total area of paper needed to wrap 150 such cones. [2]

8.

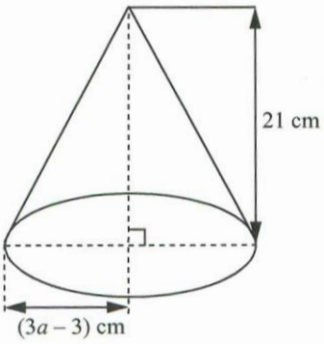


Figure 1

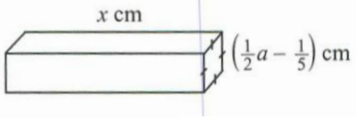


Figure 2

Figure 1 shows a metal cone of volume 567π cm^3.
   (a) Find the value of a. [3]
   (b) The metal cone is melted to make 40 cuboid blocks, shown in figure 2. Find the surface area of each cuboid block. [3]