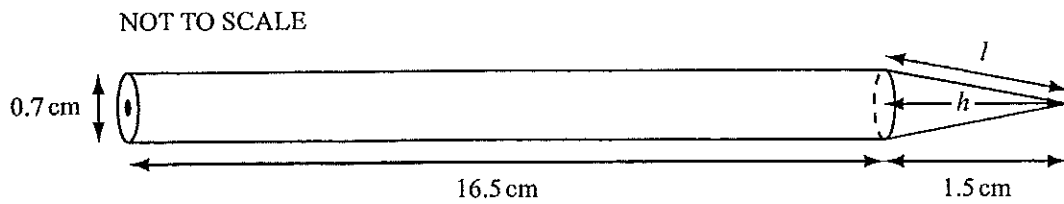


# Volume - 1

May 05 Paper 4

6



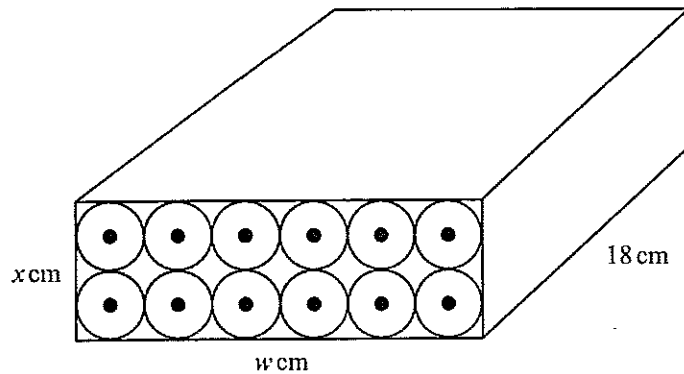
The diagram shows a pencil of length 18 cm.  
It is made from a cylinder and a cone.  
The cylinder has diameter 0.7 cm and length 16.5 cm.  
The cone has diameter 0.7 cm and length 1.5 cm.

- (a) Calculate the volume of the pencil.

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

- (b)

NOT TO SCALE



Twelve of these pencils just fit into a rectangular box of length 18 cm, width  $w$  cm and height  $x$  cm.  
The pencils are in 2 rows of 6 as shown in the diagram.

- (i) Write down the values of  $w$  and  $x$ . [2]
- (ii) Calculate the volume of the box. [2]
- (iii) Calculate the percentage of the volume of the box occupied by the pencils. [2]
- (c) Showing all your working, calculate
- (i) the slant height,  $l$ , of the cone, [2]
- (ii) the total surface area of one pencil, giving your answer correct to 3 significant figures.  
[The curved surface area,  $A$ , of a cone of radius  $r$  and slant height  $l$  is given by  $A = \pi r l$ .] [6]