

11

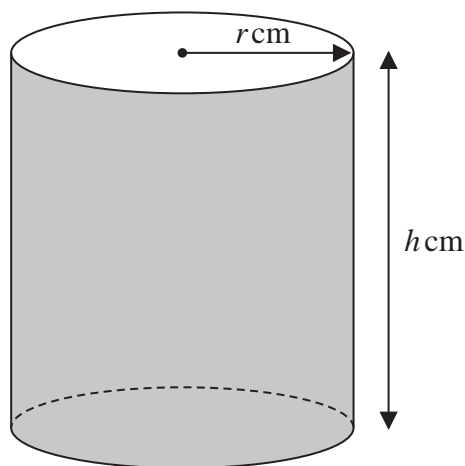
Diagram **NOT**  
accurately drawn**Figure 4**

Figure 4 shows an open container in the shape of a cylinder with radius  $r$  cm and height  $h$  cm.

Given that the total surface area of the container is  $625\pi\text{ cm}^2$

(a) show that

$$h = \frac{625 - r^2}{2r} \quad (3)$$

The volume of the container is  $V\text{ cm}^3$

Given that  $r$  can vary,

(b) use calculus to find the value, to 3 significant figures, of  $r$  for which  $V$  is a maximum.

Justify that this value of  $r$  gives a maximum value of  $V$

(6)

(c) For the value of  $r$  found in part (b), find the corresponding value, to 3 significant figures, of  $h$

(1)

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**Question 11 continued**

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Area for writing answers, consisting of multiple horizontal dotted lines.



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**Question 11 continued**

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### Question 11 continued

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**Question 11 continued**

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(Total for Question 11 is 10 marks)

**TOTAL FOR PAPER IS 100 MARKS**

