11

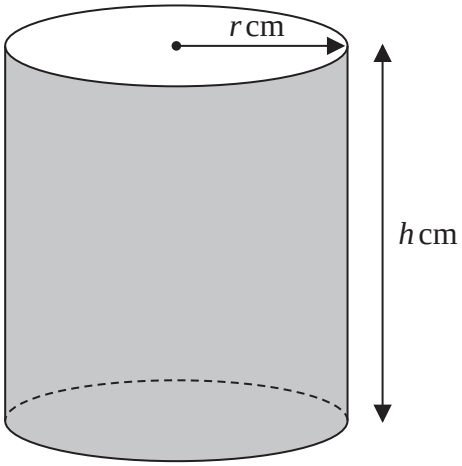

Diagram **NOT** accurately drawn

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

$$h = \frac{625 - r^2}{2r}$$

(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)

Question 11 continued

Question 11 continued

Question 11 continued

Question 11 continued

(Total for Question 11 is 10 marks)

TOTAL FOR PAPER IS 100 MARKS