8

Diagram **NOT** accurately drawn

h cm

r cm
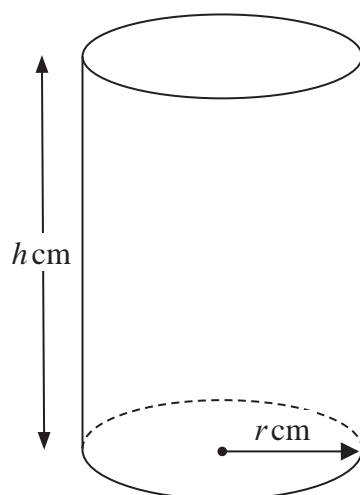
Figure 1

A solid right circular cylinder has base radius r cm and height h cm as shown in Figure 1.

The cylinder has a volume of 90π cm^3 and a total surface area of S cm^2

(a) Show that $S = 2\pi r^2 + \dfrac{180\pi}{r}$

(3)

Given that r can vary,

(b) use calculus to find, to 3 significant figures, the value of r for which S is a minimum, justifying that this value of r gives a minimum value of S

(5)

(c) Find, to 3 significant figures, the minimum value of S

(2)

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Question 8 continued

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Question 8 continued

Question 8 continued

(Total for Question 8 is 10 marks)