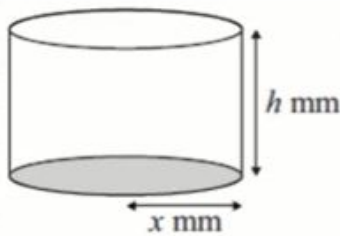




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## Calculus - Max & Min | Past Paper Question | C2 Edexcel June 2012 Q8(d)



A manufacturer produces pain relieving tablets. Each tablet is in the shape of a solid circular cylinder with base radius  $x$  mm and height  $h$  mm, as shown.

Given that the volume of each tablet has to be  $60 \text{ mm}^3$ ,

(b) show that the surface area,  $A \text{ mm}^2$ , of a tablet is given by

$$A = 2\pi x^2 + \frac{120}{x}$$

The manufacturer needs to minimise the surface area  $A \text{ mm}^2$ , of a tablet.

- (c) Use calculus to find the value of  $x$  for which  $A$  is a minimum.  $(2.1215\dots)$  (5)
- (d) Calculate the minimum value of  $A$ , giving your answer to the nearest integer. (2)

$$\text{When } x = 2.1215\dots \quad \therefore A = 2\pi(2.1215)^2 + \frac{120}{2.1215\dots}$$

$$= 84.842\dots$$

$$= 85 \text{ (to nearest integer)}$$

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