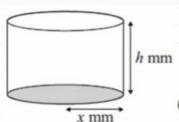## Calculus - Max & Min | Past Paper Question | C2 Edexcel June 2012 Q8(d)

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 mm³,

(b) show that the surface area, A mm², of a tablet is given by

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

The manufacturer needs to minimise the surface area A mm², of a tablet.

(c) Use calculus to find the value of x for which A is a minimum. $(2.1215...)$ **(5)**

(d) Calculate the minimum value of A, giving your answer to the nearest integer. **(2)**

when $x = 2.1215...$ ∴ $A = 2\pi (2.1215)^2 + \frac{120}{2.1215..}$

$$= 84.842...$$

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