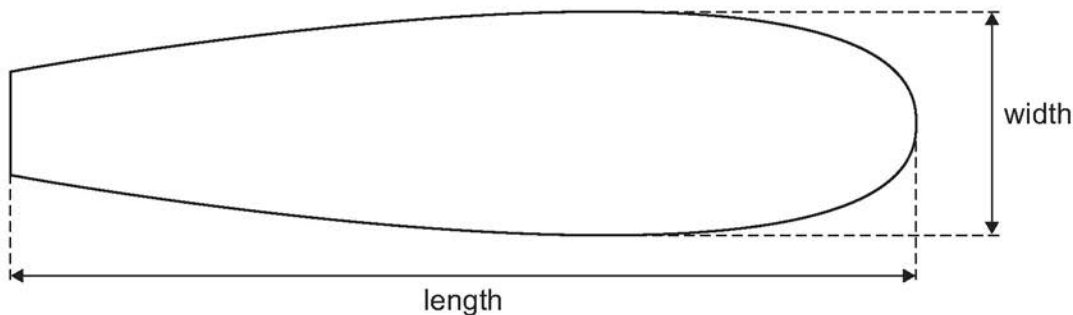**6**   A design for a surfboard is shown in **Figure 1**.
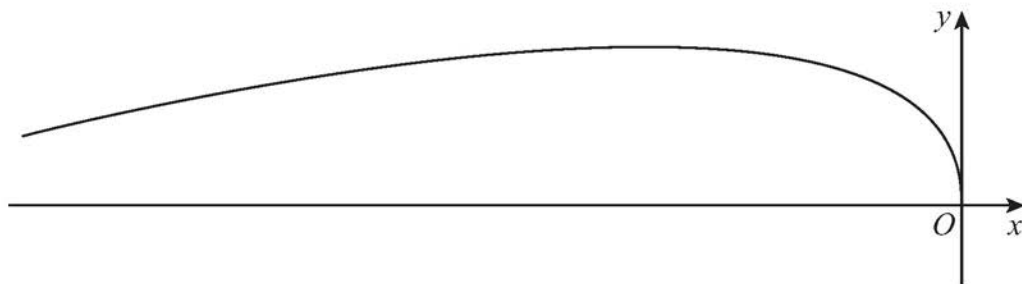
Figure 1

The curve of the **top half** of the surfboard can be modelled by the parametric equations

$$x = -2t^2$$

$$y = 9t - 0.7t^2$$

for $0 \leq t \leq 9.5$ as shown in **Figure 2**, where x and y are measured in centimetres.

Figure 2

6 (a)   Find the length of the surfboard.

[2 marks]

6 (b) (i)   Find an expression for $\dfrac{\mathrm{d}y}{\mathrm{d}x}$ in terms of t.

[3 marks]

6 (b) (ii)   Hence, show that the width of the surfboard is approximately one third of its length.

[4 marks]