7

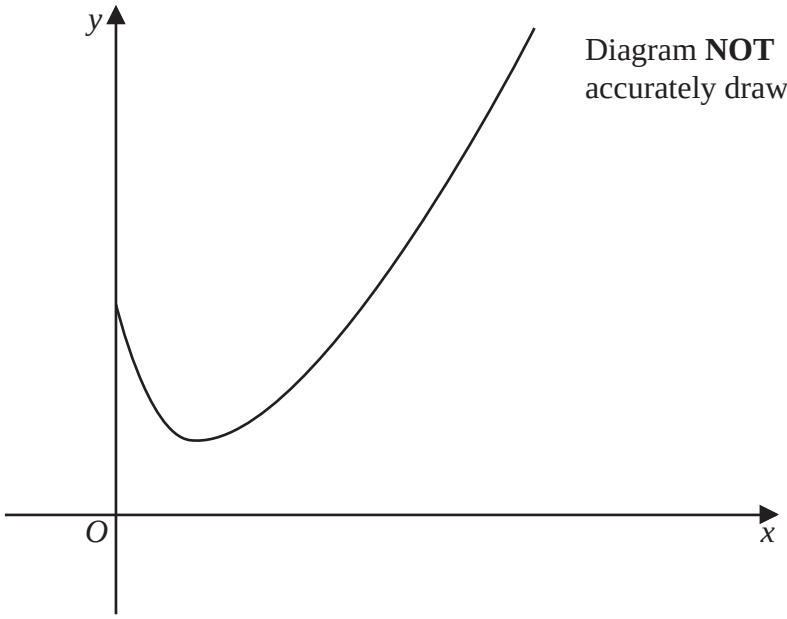

Diagram **NOT** accurately drawn

Figure 1

Figure 1 shows a sketch of part of the curve C with equation

$$y = \frac{x^2}{4} - 3\sqrt{x} + 8$$

The point P lies on C and has coordinates $(4, a)$

(a) Show that $a = 6$

(1)

The line L is the normal to C at the point P

(b) Show that an equation of L is $5y + 4x - 46 = 0$

(6)

The finite region R is bounded by the curve C, the line L, the x-axis and the line with equation $x = 1$

(c) Use calculus to find the exact area of R

(6)

Question 7 continued

Question 7 continued

Question 7 continued

(Total for Question 7 is 13 marks)