2.

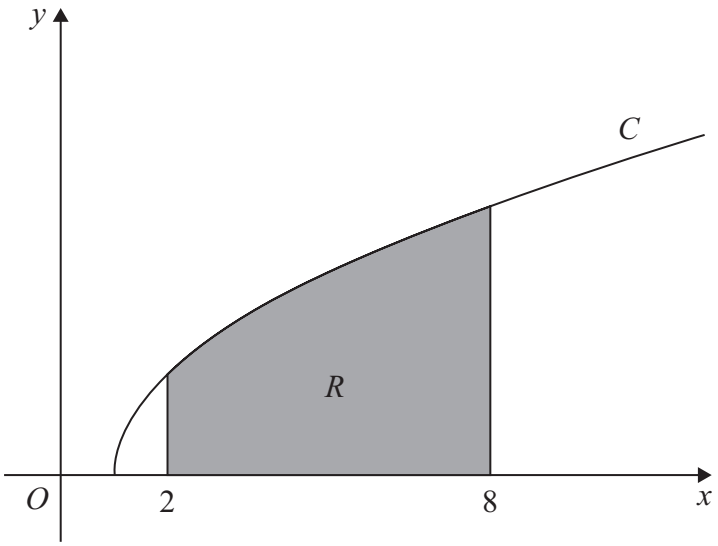


Figure 1

Figure 1 shows a sketch of the curve C with equation

$$y = \frac{5}{3}\sqrt{x-1}$$

The region R, shown shaded in Figure 1, is bounded by C, the line with equation $x = 2$, the x-axis and the line with equation $x = 8$

This region is then rotated through 2π radians about the x-axis to form a solid.

Use algebraic integration to find the exact volume of this solid.

(5)

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Question 2 continued

(Total for Question 2 is 5 marks)

3. A curve has parametric equations

$$x = \frac{t+15}{t+4} \qquad y = \frac{5}{t+2} \qquad t \geqslant 0$$

(a) Show that a Cartesian equation of the curve is $y = \mathrm{g}(x)$ where

$$\mathrm{g}(x) = \frac{ax+b}{cx+d} \qquad e < x \leqslant f$$

and a, b, c, d, e and f are constants to be found.

(5)

(b) State the range of g.

(2)

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