

12.

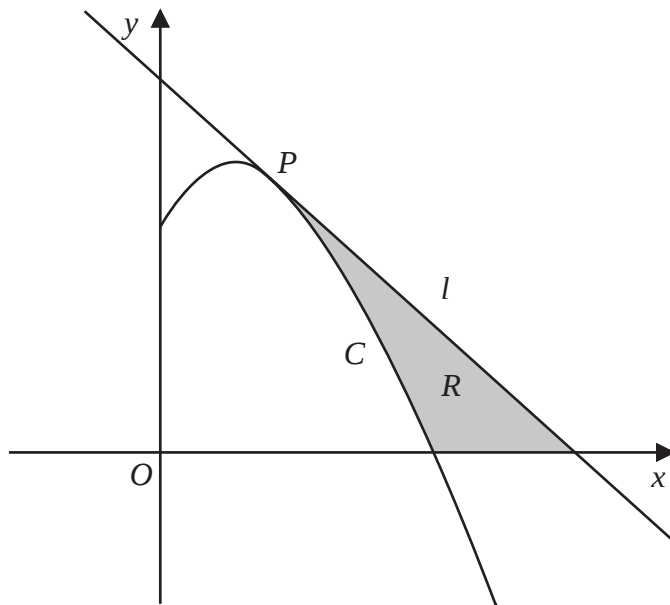


Figure 2

Figure 2 shows a sketch of the curve C with equation

$$y = 6\sqrt{x} - \frac{1}{2}x^2 + \frac{45}{2} \quad x \geq 0$$

The point $P\left(4, \frac{53}{2}\right)$ lies on C .

The line l is the tangent to C at P .

(a) Show, using calculus, that an equation for l is

$$5x + 2y = 73 \quad (5)$$

(b) Verify that C cuts the x -axis at $x = 9$ (1)

The region R , shown shaded in Figure 2, is bounded by C , l and the x -axis.

(c) Find, by algebraic integration, the area of R . (5)