



The diagram shows the curve  $y = 1 - x + \frac{6}{\sqrt{x}}$  and the line  $l$ , which is the normal to the curve at the point  $(1, 6)$ .

(a) Determine the equation of  $l$  in the form

$$ax + by = c$$

where  $a$ ,  $b$  and  $c$  are integers whose values are to be stated. [5]

(b) Verify that the curve intersects the  $x$ -axis at the point where  $x = 4$ . [1]

(c) **In this question you must show detailed reasoning.**

Determine the exact area of the shaded region enclosed between  $l$ , the curve, the  $x$ -axis and the  $y$ -axis. [5]