

7

$$f(x) = x^2 - 9x + 14$$

Given that $f(x)$ can be written in the form $(x + a)^2 + b$, where a and b are constants,

(a) find the value of a and the value of b . (2)

(b) Hence, or otherwise, find

(i) the minimum value of $f(x)$

(ii) the value of x for which this minimum occurs. (2)

The curve C has equation $y = f(x)$

The line l has equation $y = x + 5$

(c) Use algebra to find the coordinates of the points of intersection of C and l . (4)

(d) Use algebraic integration to find the exact area of the finite region bounded by C and l . (5)

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(Total for Question 7 is 13 marks)

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