

5

$$f(x) = 2x^3 + ax^2 - 14x + b \text{ where } a \text{ and } b \text{ are constants.}$$

When $f(x)$ is divided by $(x - 4)$ the remainder is 39

Given that $(x - 1)$ is a factor of $f(x)$

(a) show that $a = -3$ and find the value of b (5)

(b) Hence factorise $f(x)$ completely. (4)

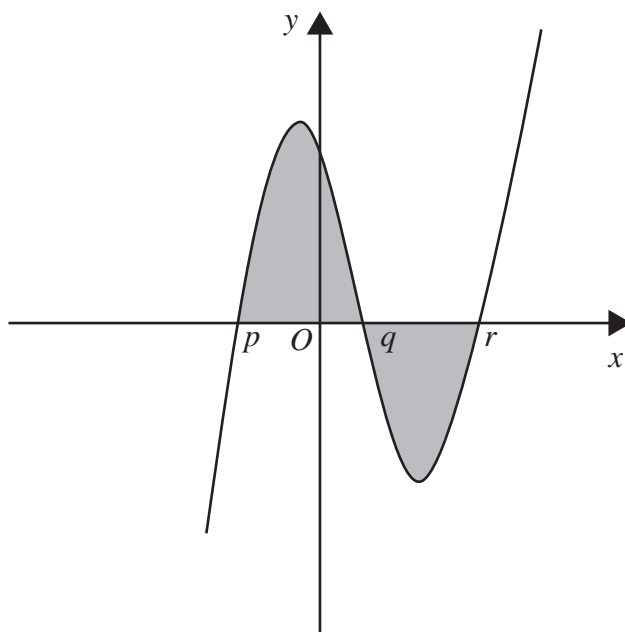


Diagram **NOT**
accurately drawn

Figure 3

Figure 3 shows part of the curve C with equation $y = f(x)$

Given that C crosses the x -axis at the points with coordinates $(p, 0)$, $(q, 0)$ and $(r, 0)$

(c) write down the value of p , the value of q and the value of r (3)

The region shown shaded in Figure 3 is bounded by the curve and the x -axis.

(d) Use algebraic integration to find the exact area of the shaded region. (4)

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Question 5 continued

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Question 5 continued

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(Total for Question 5 is 16 marks)

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