

2. Find $\int (12x^5 - 8x^3 + 3) dx$, giving each term in its simplest form.

(4)

Q2

(Total 4 marks)



5.

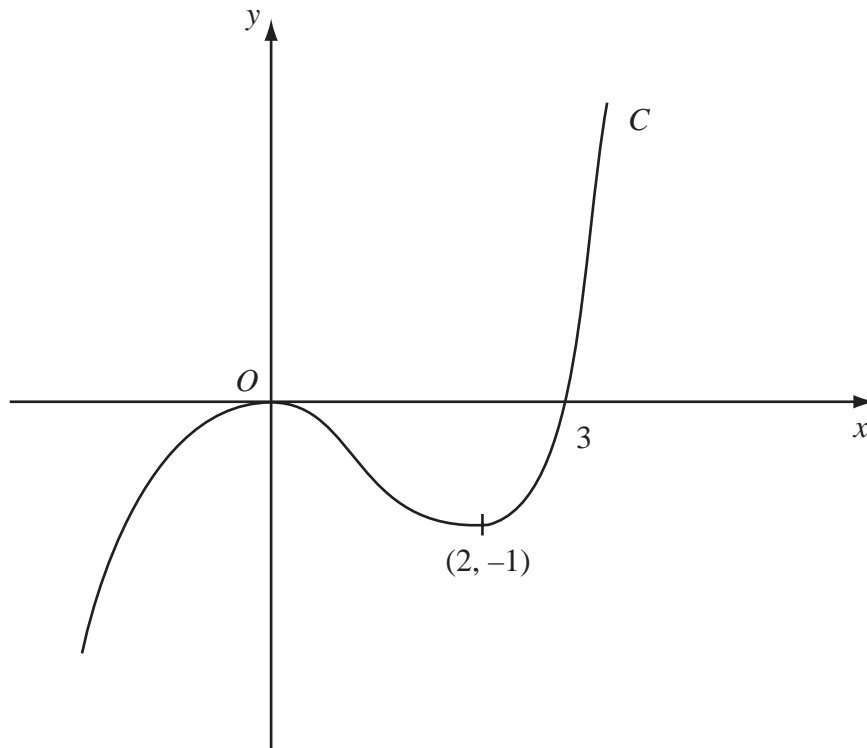
**Figure 1**

Figure 1 shows a sketch of the curve C with equation $y = f(x)$. There is a maximum at $(0, 0)$, a minimum at $(2, -1)$ and C passes through $(3, 0)$.

On separate diagrams sketch the curve with equation

(a) $y = f(x + 3)$, (3)

(b) $y = f(-x)$. (3)

On each diagram show clearly the coordinates of the maximum point, the minimum point and any points of intersection with the x -axis.



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Question 5 continued

Q5

(Total 6 marks)



8. The point $P(1, a)$ lies on the curve with equation $y = (x + 1)^2(2 - x)$.

(a) Find the value of a .

(1)

(b) On the axes below sketch the curves with the following equations:

(i) $y = (x + 1)^2(2 - x)$,

(ii) $y = \frac{2}{x}$.

On your diagram show clearly the coordinates of any points at which the curves meet the axes.

(5)

(c) With reference to your diagram in part (b) state the number of real solutions to the equation

$$(x + 1)^2(2 - x) = \frac{2}{x}.$$

(1)

