

Integration By Parts

Difficulty: Medium

Question Paper 1

Level	A Level only
Subject	Maths - Pure
Exam Board	Edexcel
Topic	Integration
Sub-Topic	By Parts
Difficulty	Medium
Booklet	Question Paper 1

Time allowed: 29 minutes

Score: /24

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>76%	61%	52%	42%	33%	23%	<23%

Question 1

(a) Find $\int \sqrt{5-x} \, dx$. (2)

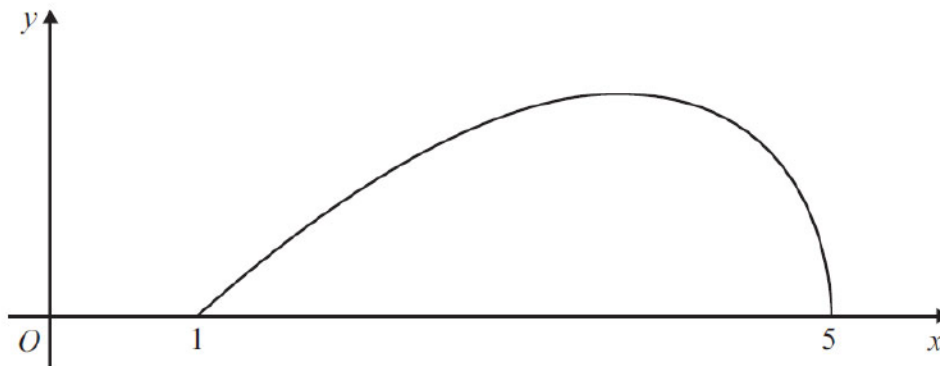


Figure 3

Figure 3 shows a sketch of the curve with equation

$$y = (x-1)\sqrt{5-x}, \quad 1 \leq x \leq 5$$

(b) (i) Using integration by parts, or otherwise, find

$$\int (x-1)\sqrt{5-x} \, dx \quad (4)$$

(ii) Hence find $\int_1^5 (x-1)\sqrt{5-x} \, dx$. (2)

(Total 8 marks)

Question 2

(b) Use integration by parts to find $\int \frac{1}{x^3} \ln x \, dx$.

(4)

(Total 4 marks)

Question 3

(a) Use integration by parts to find $\int x e^x \, dx$.

(3)

(b) Hence find $\int x^2 e^x \, dx$.

(3)

(Total 6 marks)

Question 4

(a) Use integration by parts to find $\int x \sin 3x \, dx$. (3)

(b) Using your answer to part (a), find $\int x^2 \cos 3x \, dx$. (3)

(Total 6 marks)