



Integration

Questions

Suitable for:

Pearson Edexcel International A-Level (iAL) — Pure Mathematics 2



Question 1

Evaluate

$$\int_1^5 (3x^2 - 4x + 2)dx$$

(4 marks)

Total for question = 4 marks



Question 2

Evaluate

$$\int_1^9 \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right) dx$$

giving your answer as an exact fraction.

(5 marks)

Total for question = 5 marks



Question 3

Evaluate

$$\int_1^4 \frac{x^2 + 3x}{\sqrt{x}} dx$$

giving your answer as an exact fraction.

(6 marks)

Total for question = 6 marks



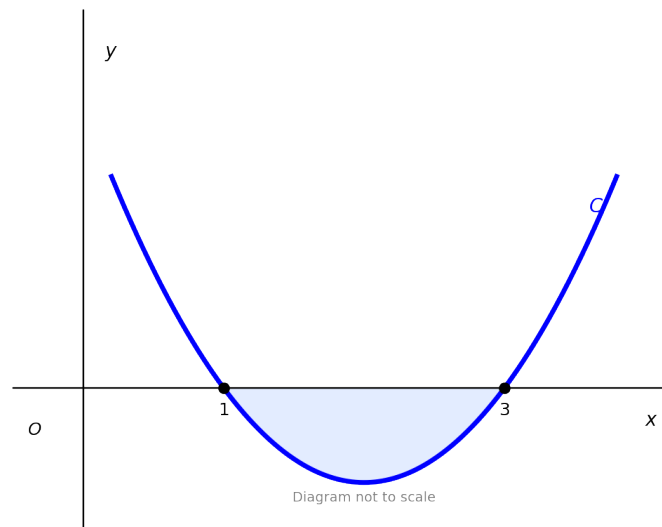


Question 4

Figure 1 shows part of the curve C with equation

$$y = x^2 - 4x + 3$$

The curve crosses the x -axis at the points where $x = 1$ and $x = 3$.



(a) Find

$$\int_1^3 (x^2 - 4x + 3) dx$$

(3 marks)

(b) Hence find the area of the finite region enclosed by C and the x -axis.

(1 marks)

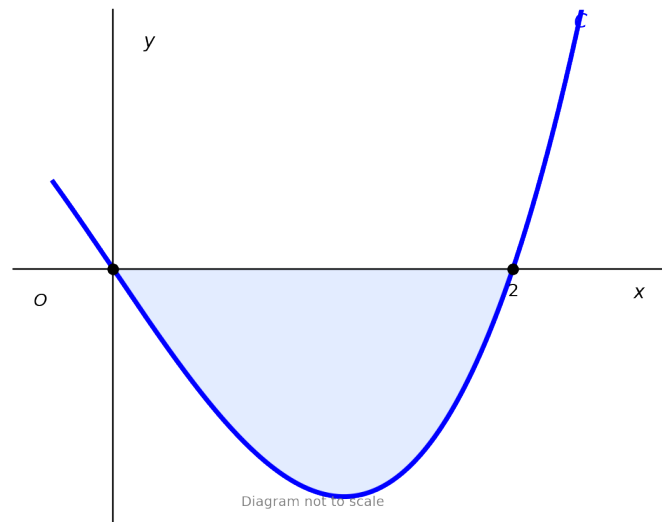
Total for question = 4 marks



Question 5

Figure 2 shows part of the curve C with equation

$$y = x^3 - 4x$$



(a) Find

$$\int_0^2 (x^3 - 4x) dx$$

(3 marks)

(b) Explain why the answer to part (a) does not give the area of the shaded region, and find the exact area of the shaded region.

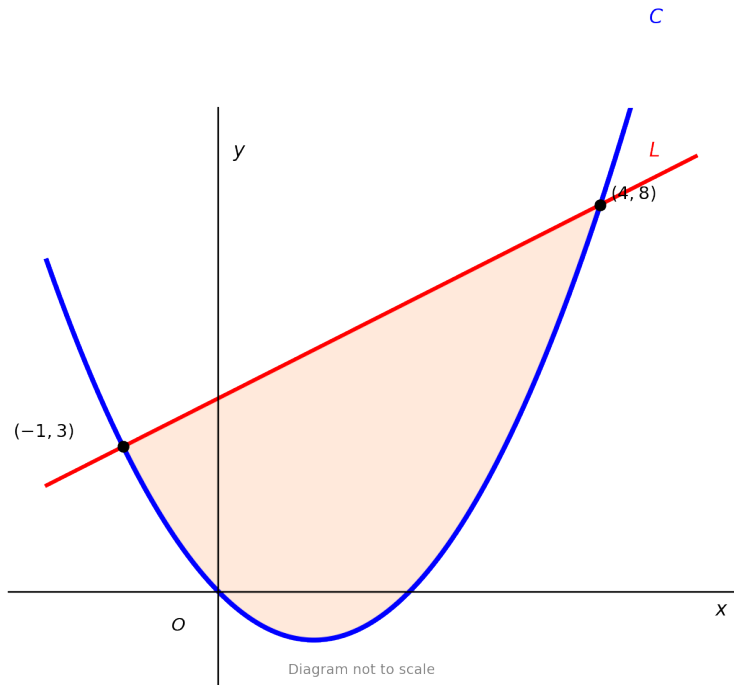
(3 marks)

Total for question = 6 marks



Question 6

Figure 3 shows the curve C with equation $y = x^2 - 2x$ and the line L with equation $y = x + 4$.



(a) Find the x -coordinates of the points where C and L intersect.

(3 marks)

(b) Find the exact area of the finite region enclosed by C and L .

(5 marks)

Total for question = 8 marks

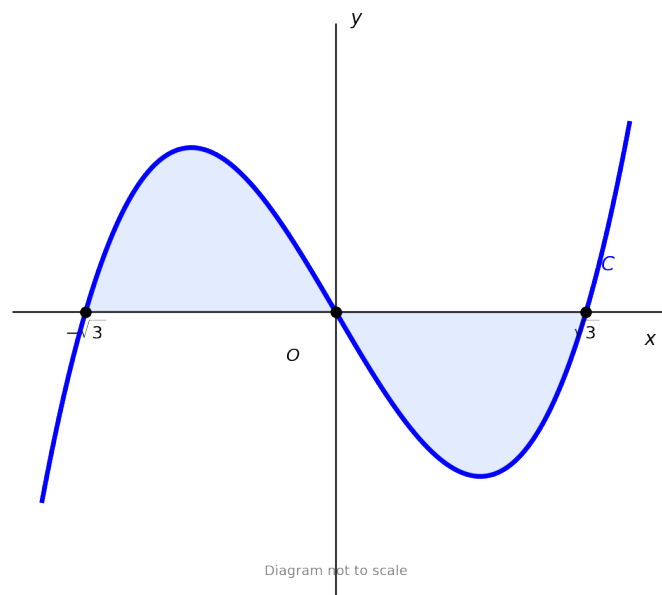


Question 7

Figure 4 shows part of the curve C with equation

$$y = x^3 - 3x$$

The curve crosses the x -axis at $x = 0$, $x = \sqrt{3}$ and $x = -\sqrt{3}$.



Find the total area of the two finite regions enclosed by C and the x -axis for $-\sqrt{3} \leq x \leq \sqrt{3}$.

(7 marks)

Total for question = 7 marks



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Question 8

The curve C has equation $y = x^2 + kx$, where k is a constant. The curve passes through the point $(4, 0)$.

(a) Find the value of k .

(1 marks)

(b) Write down the x -coordinates of the two points where C crosses the x -axis.

(1 marks)

(c) Find the exact area of the finite region enclosed by C and the x -axis.

(5 marks)

Total for question = 7 marks