

8.1 Integration

Question Paper

Course	Edexcel IAL Maths: Pure 2
Section	8. Integration
Topic	8.1 Integration
Difficulty	Easy

Time allowed: 50

Score: /40

Percentage: /100

Question 1

Evaluate

(i) $\int_1^2 4x \, dx,$

(ii) $\int_0^3 (9x^2 + 4x) \, dx.$

[4 marks]**Question 2**

Evaluate

$$\int_{-3}^4 (2kx + 3kx^2) \, dx$$

giving your answer in terms of k .**[4 marks]**

Question 3

The area bounded by the curve with equation $y = 9 - x^2$, the x -axis and the vertical lines with equations $x = 1$ and $x = 2$ is to be found.

(a) Write down an integral that would find this area.

[2 marks]

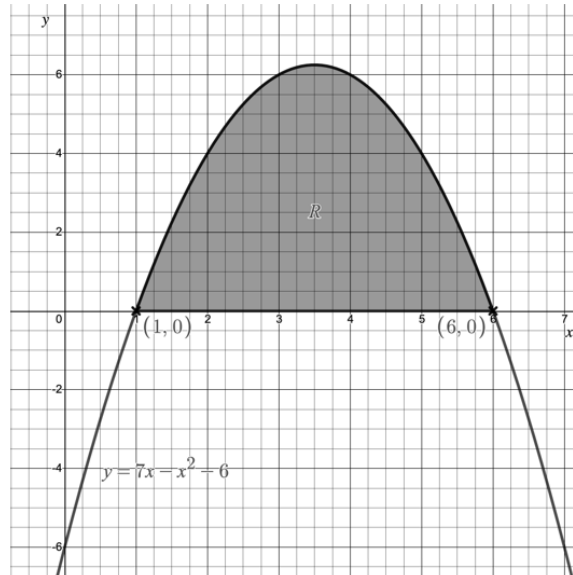
Question 3

(b) Evaluate your integral from part (a) and hence find the area described above.

[3 marks]

Question 4

The diagram below shows the graph of $y = 7x - x^2 - 6$.

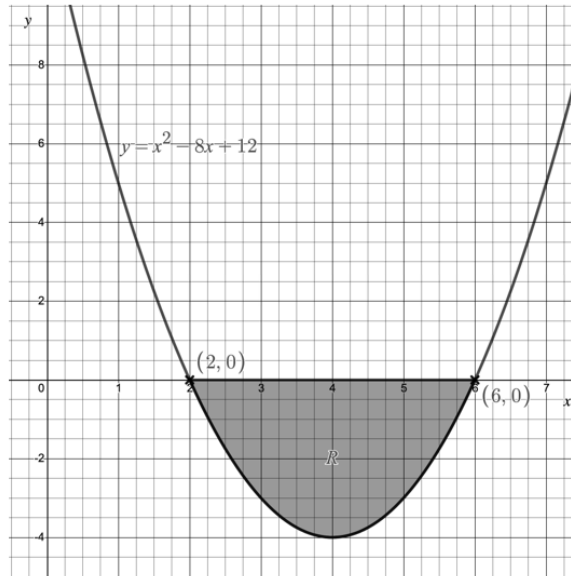


Find the shaded area, giving your answer as a fraction in its simplest terms.

[3 marks]

Question 5

The diagram below shows the graph of $y = x^2 - 8x + 12$.



Find the shaded area marked R , giving your answer as a fraction in its simplest form.

[4 marks]

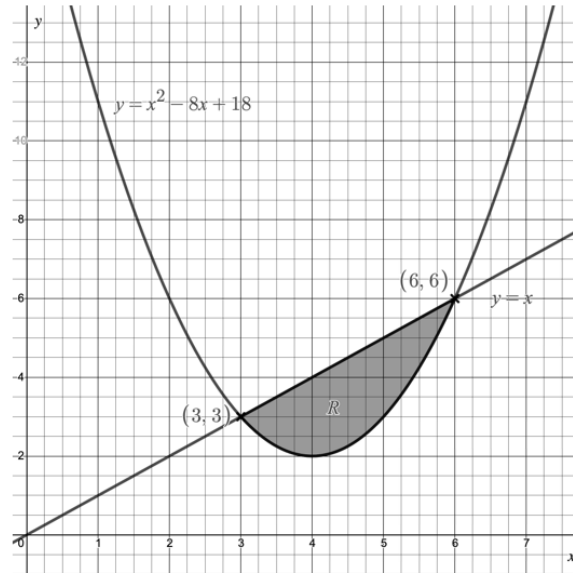
Question 6

(a) Simplify $x - (x^2 - 8x + 18)$.

[1 mark]

Question 6

The diagram below shows the graphs of $y = x^2 - 8x + 18$ and $y = x$.



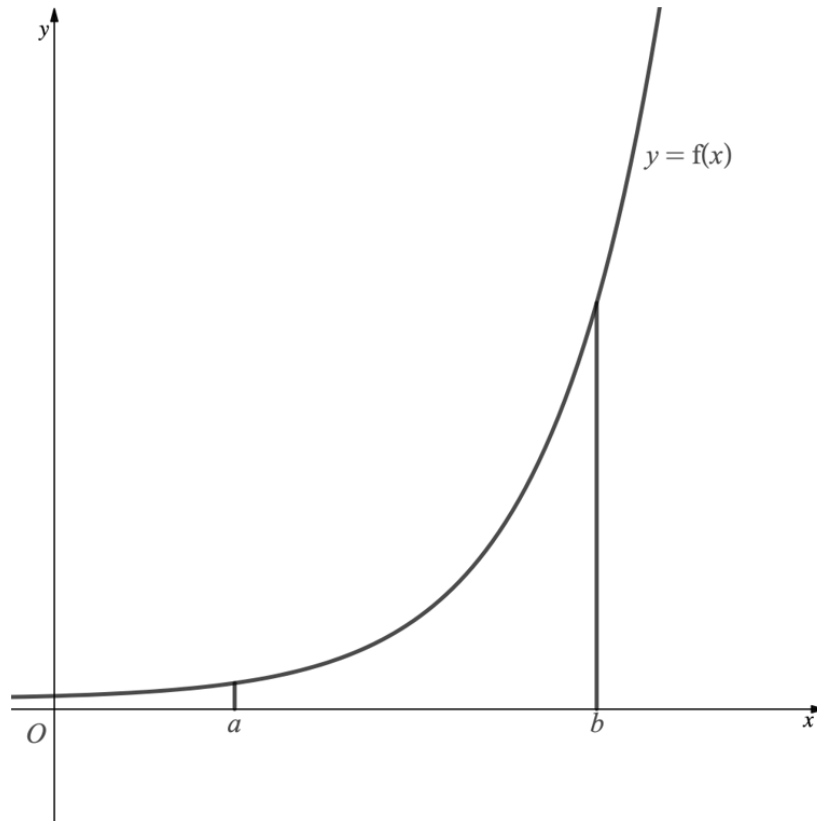
(b) Find the shaded area marked R , giving your answer as a fraction in its simplest terms.

[4 marks]

Question 7

A student is estimating the area bounded by the curve $y = f(x)$, the x -axis and the lines $x = a$ and $x = b$.

The student intends to estimate the area by using trapezia of equal width.

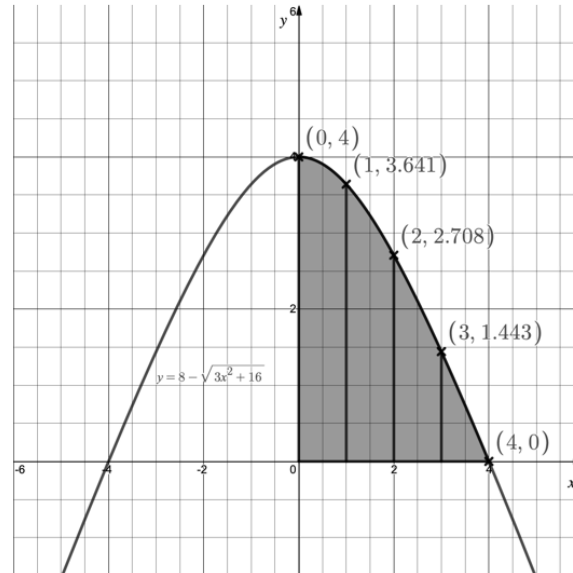


Add to the diagram above to show how the student can use 4 trapezia to estimate the area.

[2 marks]

Question 8

The graph of $y = 8 - \sqrt{3x^2 + 16}$ is shown below.



(a) Use the trapezium rule, with four strips (such that $n = 4$ and $h = 1$), to estimate the shaded area. You may use the values on the graph to help.

[3 marks]

Question 8

(b) State whether the estimate in part (a) is an under-estimate or an over-estimate, giving a reason for your answer.

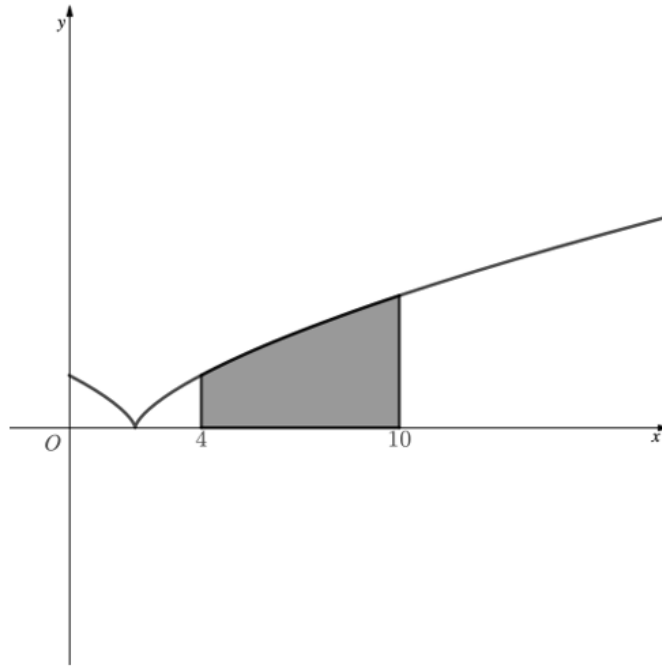
[2 marks]



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Question 9

The diagram below shows part of the graph with equation $y = (x - 2)^{\frac{2}{3}}$.



The trapezium rule is to be used to estimate the shaded area of the graph which is given by the integral

$$\int_4^{10} (x - 2)^{\frac{2}{3}} dx.$$

- (i) All of the values in the table below will be used in the trapezium rule. Write down the number of ordinates that will be used, the number of strips and the width of each strip.

x	4	5	6	7	8	9	10
y	1.59	2.08	2.52	2.92	3.30	3.70	4.00

- (ii) Apply the trapezium rule, using the values above, to find an estimate of the shaded area.
- (iii) State, with a reason, whether your answer to part (ii) is an over-estimate or an under-estimate.

[8 marks]



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