



eClassroom

Question 1

In this question, you must show all stages of your working.

Solutions relying on calculator technology are not acceptable.

Sketch the line l with equation $x + y = 6$ and the curve C with equation $y = 6x - 2x^2 + 1$.

The line l intersects the curve C at the points P and Q .

- (a)** Find, using algebra, the coordinates of P and the coordinates of Q .

(4 marks)

The region R_i shown shaded, is bounded by C , l , and the x -axis.

- (b) Use inequalities to define the region R .

(3 marks)

Total for question = 7 marks

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**Question 2**

The curve C has the equation:

$$y = 2x^2 - 8x + 5.$$

(a) Write C in the form:

$$y = a(x + b)^2 + c,$$

where a , b , and c are constants to be found.

(3 marks)

The point M is the minimum turning point of C .

(b) Deduce the coordinates of M .

(2 marks)

The line l is the normal to C at the point P , where $x = 3$.

Given that l has the equation $y = kx + c$, where k is a constant:

(c) (i) Find the coordinates of P .

(3 marks)

(ii) Find the value of k .

(3 marks)

The finite region R is bounded by l , C , and the line through M parallel to the y -axis.

(d) Identify the inequalities that define R .

(3 marks)

Total for question = 14 marks







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Question 3

In this question, you must show all stages of your working.

Solutions relying on calculator technology are not acceptable.

Solve the inequality:

$$4x^2 - 5x + 1 \geq 2x + 3.$$

Total for question = 4 marks

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.



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Question 4

(a) On the same axes, sketch the graphs of $y = x + 3$ and $y = x^2 - 3x - 10$, showing the coordinates of all points at which each graph crosses the coordinate axes.

(4 marks)

(b) On your sketch, show, by shading, the region R defined by the inequalities:

$$y < x + 3 \quad \text{and} \quad y > x^2 - 3x - 10.$$

(1 mark)

(c) Hence, or otherwise, find the set of values of x for which:

$$x^2 - 4x - 12 < 0.$$

(3 marks)

Total for question = 8 marks



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