

Write your name here

Surname

Other names

Pearson Edexcel
Level 3 GCE

Centre Number

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Candidate Number

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Mathematics

Year 11 to Year 12 Transition Paper

Equations and Inequalities

You must have:

Mathematical Formulae and Statistical Tables,
calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for algebraic manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Answers should be given to three significant figures unless otherwise stated.


Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer cross it out and put your new answer and any working out underneath.

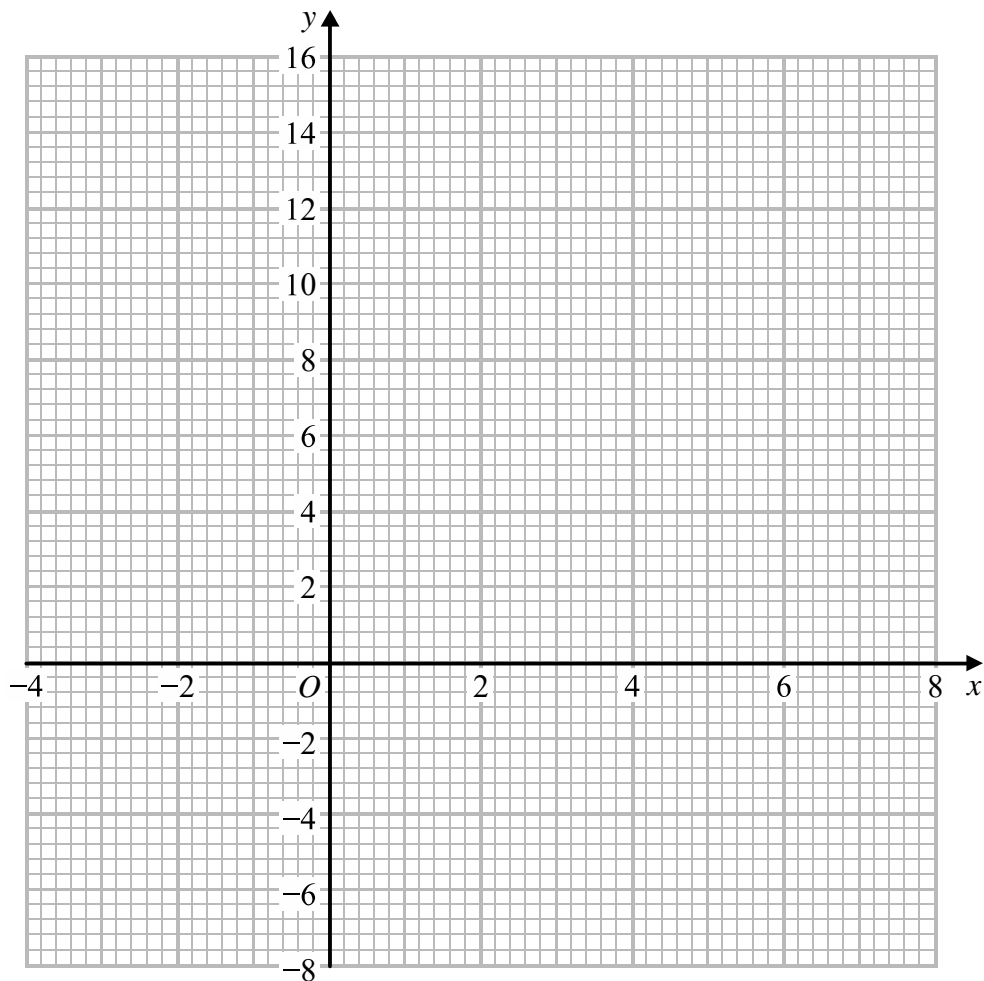
Turn over ►

Calculators may NOT be used to answer these questions unless a  symbol is shown next to the question.

1. On the grid, shade the region that satisfies all these inequalities.

$$x > 0 \quad y > 0 \quad y > 3x - 6 \quad 2x + y < 12$$

Label the region **R**.



(Total for Question 1 is 4 marks)

2. Solve $6(2 - 3x) < 5(x + 1)$

(Total for Question 2 is 3 marks)

3. (a) Solve $x^2 \geq 4x + 5$

(3)

(b) For what range of values of b has the equation $25x^2 + bx + 16 = 0$ no real roots?

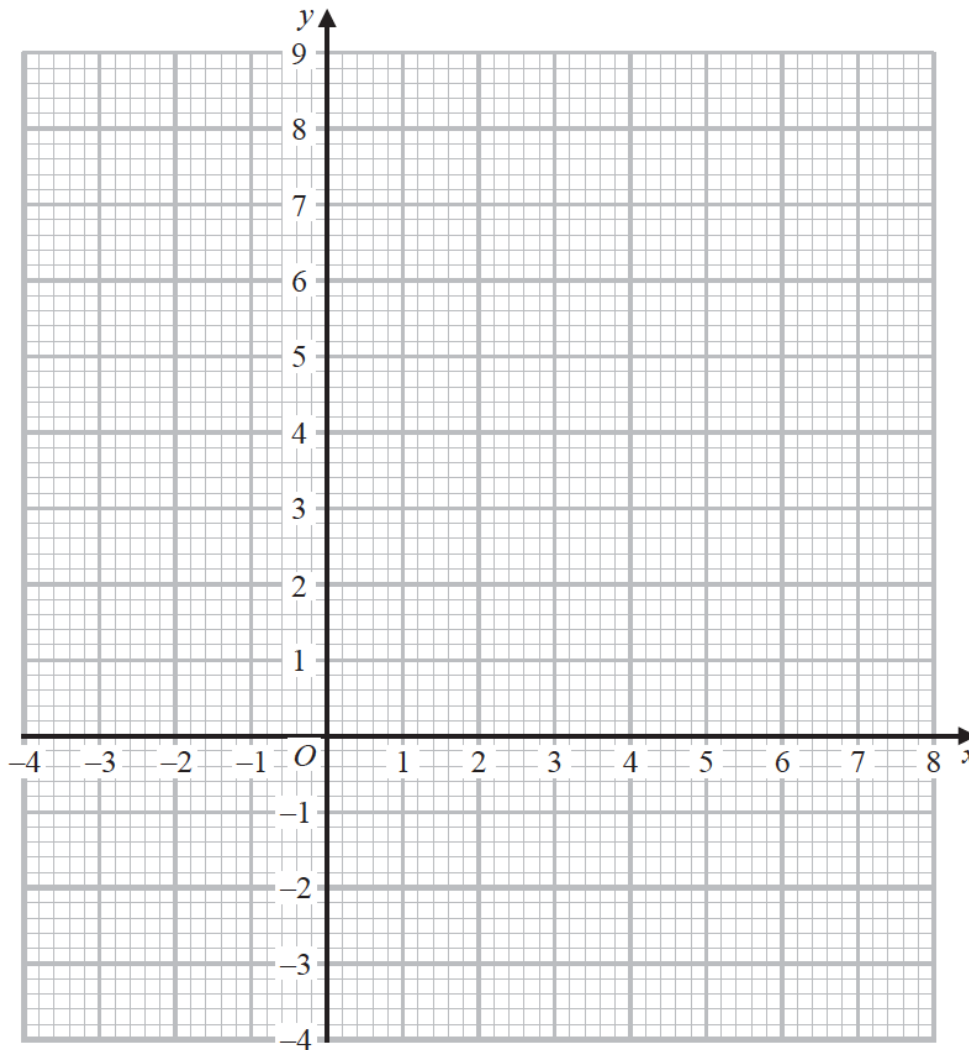
(2)

(Total for Question 3 is 5 marks)

4. (a) On the grid, shade the region that satisfies all these inequalities.

$$x < 3 \quad y - x < 5 \quad 7x + 5y > 35$$

Label the region **R**



(5)

(b) Write down the coordinates of each of the points, with integer coordinates, that satisfy

$$x < 3 \quad y - x < 5 \quad 7x + 5y > 35$$

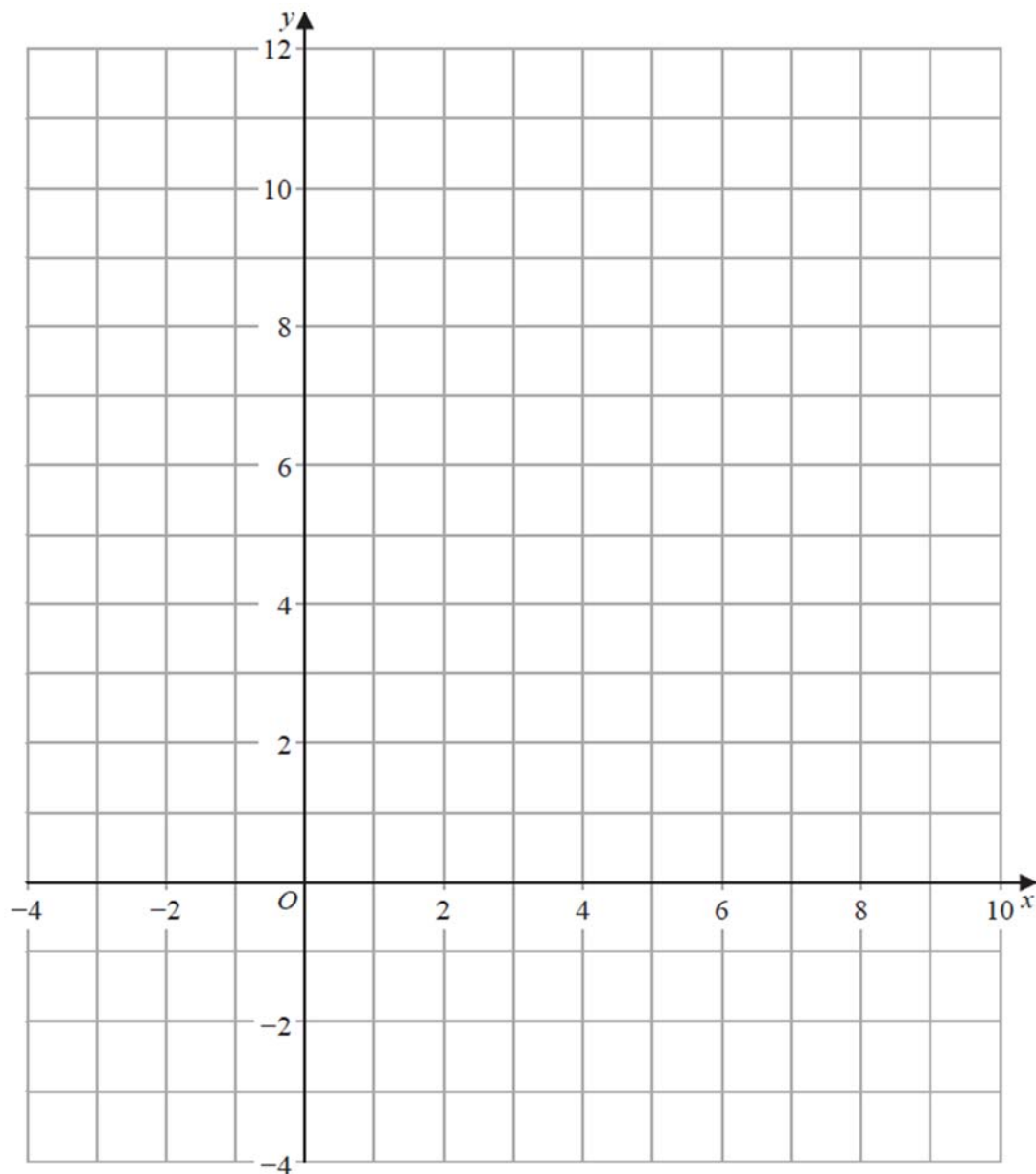
(1)

(Total for Question 4 is 6 marks)

5. On the grid, shade the region that satisfies all these inequalities.

$$4x + 3y < 24 \quad x > -2 \quad 3y > 9 - x$$

Label the region **R**.



(Total for Question 5 is 5 marks)

6. Solve, algebraically, the simultaneous equations

$$2x^2 + 2y = 7$$

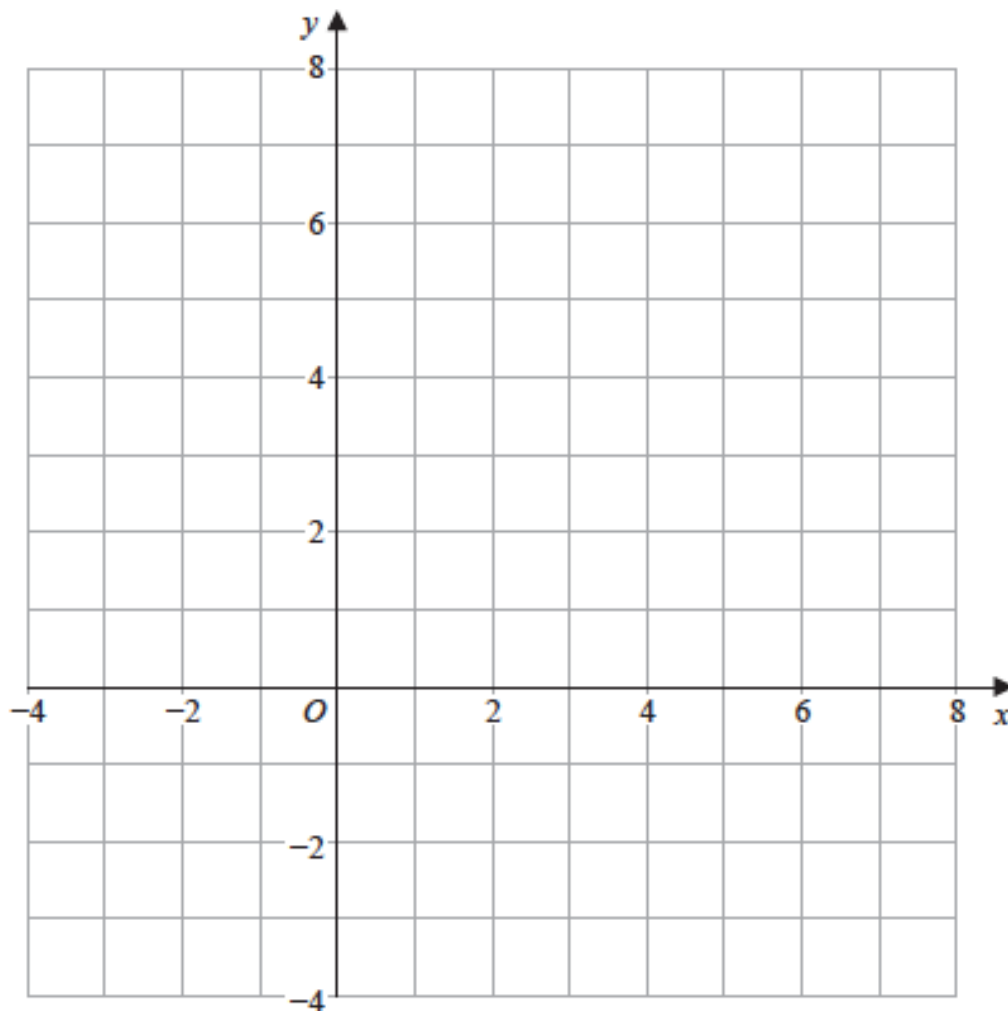
$$2y + 2x = 3$$

(Total for Question 6 is 5 marks)

7. On the grid, shade the region that satisfies all these inequalities.

$$x > -1 \quad 2x + y < 6 \quad y < 4 - x$$

Label the region **R**.



(Total for Question 7 is 5 marks)

8. Solve, algebraically, the simultaneous equations

$$2x + y = 7$$

$$4x^2 + 3y^2 = 43$$

(Total for Question 8 is 5 marks)

9. Solve the simultaneous equations

$$y - 2x - 4 = 0$$

$$4x^2 + y^2 + 20x = 0$$

(Total for Question 9 is 7 marks)

10. Solve the simultaneous equations

$$y + 4x + 1 = 0$$

$$y^2 + 5x^2 + 2x = 0$$

(Total for Question 10 is 6 marks)

11. Find the set of values of x for which

(a) $2(3x + 4) > 1 - x$, **(2)**

(b) $3x^2 + 8x - 3 < 0$. **(4)**

(Total for Question 11 is 6 marks)

12. Find the set of values of x for which

(a) $4x - 5 > 15 - x$, **(2)**

(b) $x(x - 4) > 12$. **(4)**

(Total for Question 12 is 6 marks)

13. Solve the simultaneous equations

$$x + y = 2$$

$$4y^2 - x^2 = 11$$

(Total for Question 13 is 7 marks)

14. The curve C has equation $y = x(5 - x)$ and the line L has equation $2y = 5x + 4$.

(a) Use algebra to show that C and L do not intersect. (4)

(b) Sketch C and L on the same diagram, showing the coordinates of the points at which C and L meet the axes. (4)

(Total for Question 14 is 8 marks)



15. (i) Show that $x^2 - 8x + 17 > 0$ for all real values of x .

(3)

(ii) "If I add 3 to a number and square the sum, the result is greater than the square of the original number."

State, giving a reason, if the above statement is always true, sometimes true or never true.

(2)

(Total for Question 15 is 5 marks)
