



Equations and Inequalities - Edexcel Past Exam Questions 2

1. Find the set of values of x for which

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

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

Jan 12 Q3

2. 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)

Jan 12 Q5

3. The equation

$$(k + 3)x^2 + 6x + k = 5, \text{ where } k \text{ is a constant,}$$

has two distinct real solutions for x .

(a) Show that k satisfies

$$k^2 - 2k - 24 < 0. \quad (4)$$

(b) Hence find the set of possible values of k . (3)

Jan 13 Q9

4. Find the set of values of x for which

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

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

June 13 Q5



5. Given the simultaneous equations

$$\begin{aligned}2x + y &= 1 \\ x^2 - 4ky + 5k &= 0\end{aligned}$$

where k is a non zero constant,

(a) show that $x^2 + 8kx + k = 0$. (2)

Given that $x^2 + 8kx + k = 0$ has equal roots,

(b) find the value of k . (3)

(c) For this value of k , find the solution of the simultaneous equations. (3)

June 13 Q10

6. A rectangular room has a width of x m.

The length of the room is 4 m longer than its width.

Given that the perimeter of the room is greater than 19.2 m,

(a) show that $x > 2.8$. (3)

Given also that the area of the room is less than 21 m^2 ,

(b) (i) write down an inequality, in terms of x , for the area of the room.

(ii) Solve this inequality. (4)

(c) Hence find the range of possible values for x . (1)

June 13(R) Q8

7.

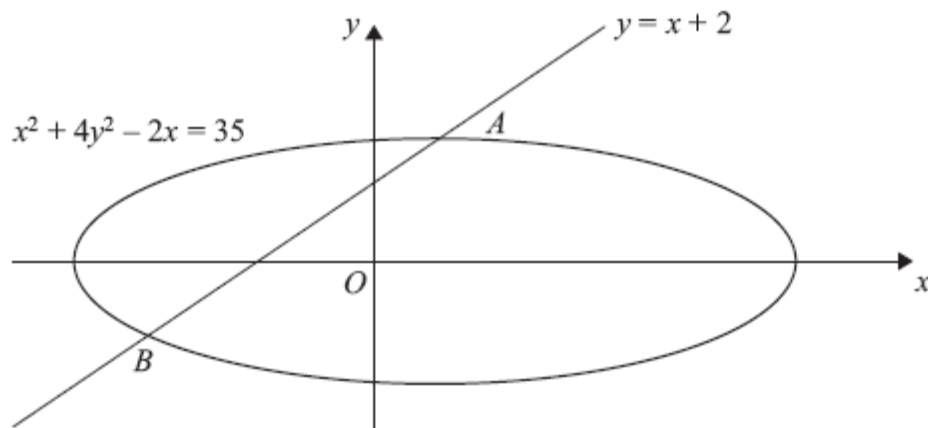


Figure 2

The line $y = x + 2$ meets the curve $x^2 + 4y^2 - 2x = 35$ at the points A and B as shown in Figure 2.

(a) Find the coordinates of A and the coordinates of B . (6)

(b) Find the distance AB in the form $r\sqrt{2}$, where r is a rational number. (3)

June 13(R) Q11

8. Find the set of values of x for which

(a) $3x - 7 > 3 - x$, (2)

(b) $x^2 - 9x \leq 36$, (4)

(c) **both** $3x - 7 > 3 - x$ **and** $x^2 - 9x \leq 36$. (1)

June 14 Q3

9.

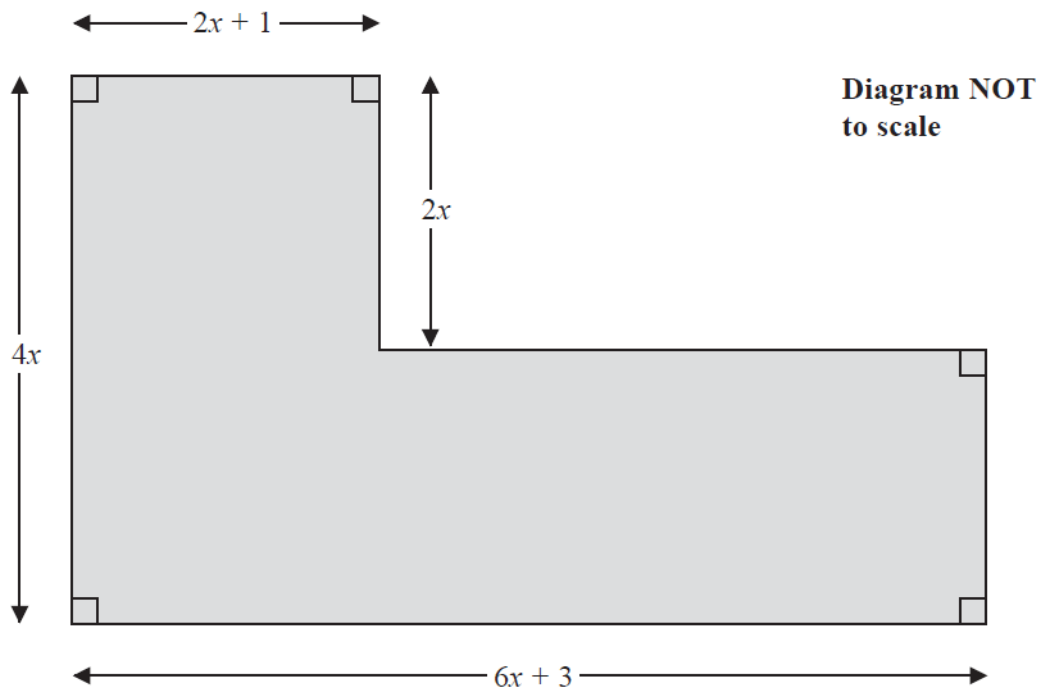
**Figure 1**

Figure 1 shows the plan of a garden. The marked angles are right angles.

The six edges are straight lines.

The lengths shown in the diagram are given in metres.

Given that the perimeter of the garden is greater than 40 m,

(a) show that $x > 1.7$. (3)

Given that the area of the garden is less than 120 m^2 ,

(b) form and solve a quadratic inequality in x . (5)

(c) Hence state the range of the possible values of x . (1)

June 14(R) Q6



10. Solve the simultaneous equations

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

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

(7)

June 15 Q2

11. The equation

$$(p - 1)x^2 + 4x + (p - 5) = 0, \text{ where } p \text{ is a constant,}$$

has no real roots.

(a) Show that p satisfies $p^2 - 6p + 1 > 0$. (3)

(b) Hence find the set of possible values of p . (4)

June 15 Q5

12. Solve the simultaneous equations

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

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

(6)

June 16 Q5

13. The straight line with equation $y = 3x - 7$ does not cross or touch the curve with equation $y = 2px^2 - 6px + 4p$, where p is a constant.

(a) Show that $4p^2 - 20p + 9 < 0$. (4)

(b) Hence find the set of possible values of p . (4)

June 16 Q8



14. (a) On separate axes sketch the graphs of
- (i) $y = -3x + c$, where c is a positive constant,
 - (ii) $y = \frac{1}{x} + 5$

On each sketch show the coordinates of any point at which the graph crosses the y -axis and the equation of any horizontal asymptote. (4)

Given that $y = -3x + c$, where c is a positive constant, meets the curve $y = \frac{1}{x} + 5$ at two distinct points,

- (b) show that $(5 - c)^2 > 12$ (3)
- (c) Hence find the range of possible values for c . (4)

June 17 Q9
