



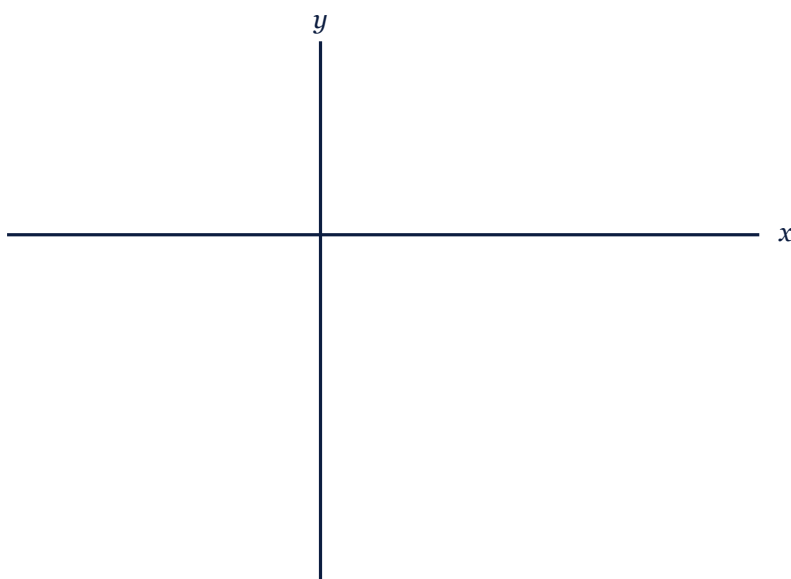
Scan for the solutions

Name: _____ **Date:** _____ **Score:** _____ / 54

- 1** Find the set of values of x for which $5 - 3x < 2x + 20$, giving your answer in set notation. (2 marks)

Answer _____

- 2** Solve the inequality $x^2 - 2x - 15 > 0$



(3 marks)

Answer _____

- 3** Find the set of values of x for which $2x^2 + x - 6 \leq 0$, giving your answer in set notation. (3 marks)

Answer _____

4

Find the set of values of x for which both $3x - 7 > 2$ and $x^2 - 9x + 14 < 0$

(4 marks)

Answer _____

5

Find the set of values of x for which $x^2 + 4x - 1 \geq 0$. Give your answer in set notation, using exact values.

(3 marks)

Answer _____

6

The equation $kx^2 + 4x + (k - 3) = 0$, where k is a non-zero constant, has no real roots.

a. Show that $k^2 - 3k - 4 > 0$

b. Hence find the set of possible values of k .

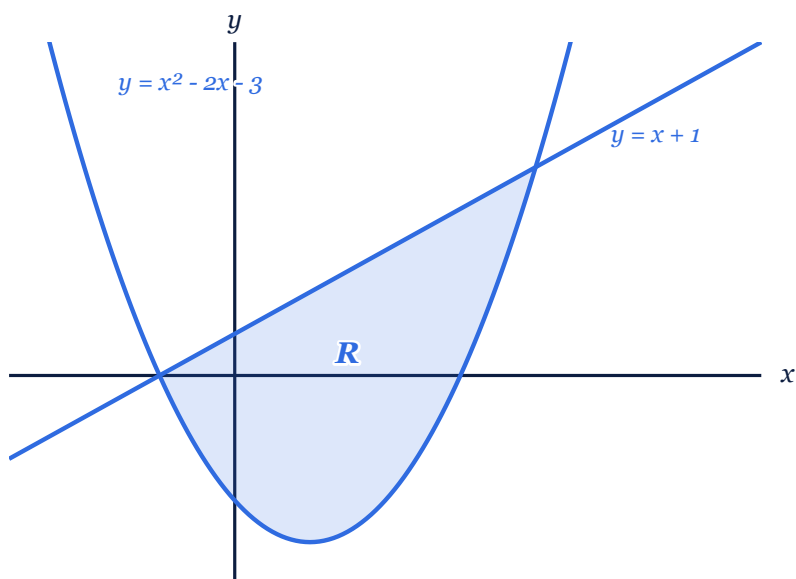
(5 marks)

Answer _____

7

The diagram shows the curve with equation $y = x^2 - 2x - 3$ and the line with equation $y = x + 1$. The region R , shown shaded, is bounded by the curve and the line. R does not include its boundary.

- Find the coordinates of the points where the line meets the curve.
- Use inequalities to define the region R .



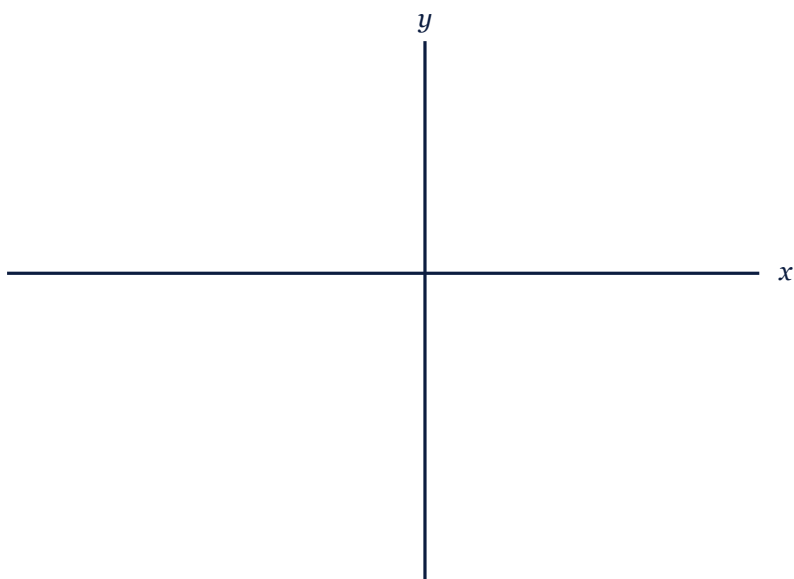
(5 marks)

Answer _____

8

The curve C has equation $y = 4 - x^2$ and the line l has equation $y = x - 2$

- Find the coordinates of the points where l meets C .
- On the axes, sketch C and l , and shade the region that satisfies both $y \leq 4 - x^2$ and $y \geq x - 2$



(5 marks)

Answer _____

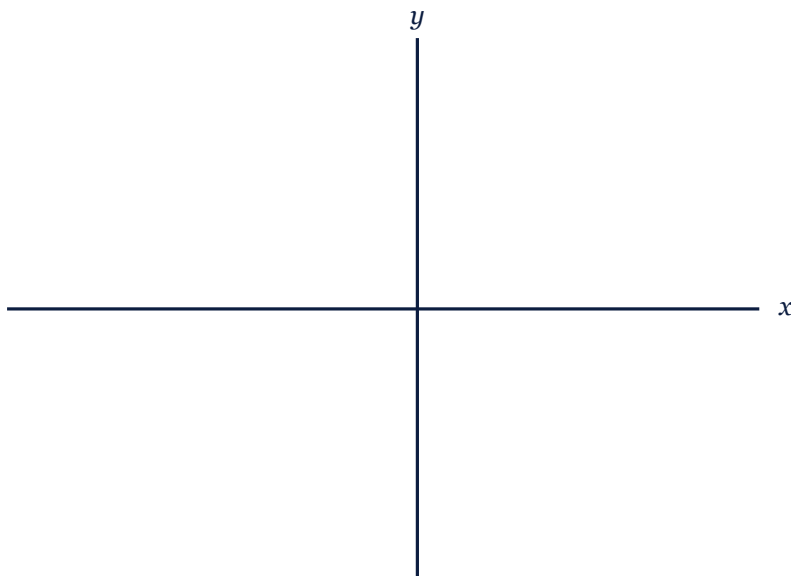
9

The line with equation $y = kx - 2$, where k is a constant, meets the curve with equation $y = x^2 + 2x + 2$ at two distinct points. Find the set of possible values of k .

(5 marks)

Answer _____

- 10 Find the set of values of x for which $\frac{12}{x} < x + 1$, $x \neq 0$. Give your answer in set notation.



(6 marks)

Answer _____

- 11 A rectangular patio has length $(2x + 3)$ m and width $(x - 1)$ m. The perimeter of the patio must be more than 30 m and its area must be less than 52 m^2 .

a. Show that $x > \frac{13}{3}$

b. Find the set of possible values of x .

(6 marks)

Answer _____

12

Tomasz volleys a ball in a park in Bristol. The height h metres of the ball above the ground t seconds after it is kicked is modelled by

$$h = 1 + 12t - 5t^2$$

- Find, in set notation, the values of t for which the ball is more than 5 m above the ground.
- Find the time at which the model predicts the ball hits the ground. Give your answer to 3 significant figures.
- Hence state a suitable range of values of t for which the model is valid.

(7 marks)

Answer _____

End of questions | Total 54 marks