

Inequalities

- 1 Give your answers in set notation.
- a Solve the inequality $3x - 8 > x + 13$. (2 marks)
- b Solve the inequality $x^2 - 5x - 14 > 0$. (4 marks)
- 2 Find the set of values of x for which $(x - 1)(x - 4) < 2(x - 4)$. (6 marks)
- 3 a Use algebra to solve $(x - 1)(x + 2) = 18$. (2 marks)
- b Hence, or otherwise, find the set of values of x for which $(x - 1)(x + 2) > 18$.
Give your answer in set notation. (2 marks)
- 4 Find the set of values of x for which:
- a $6x - 7 < 2x + 3$ (2 marks)
- b $2x^2 - 11x + 5 < 0$ (4 marks)
- c $5 < \frac{20}{x}$ (4 marks)
- d both $6x - 7 < 2x + 3$ and $2x^2 - 11x + 5 < 0$. (2 marks)
- 5 Find the set of values of x that satisfy $\frac{8}{x^2} + 1 \leq \frac{9}{x}$, $x \neq 0$ (5 marks)
- 6 Find the values of k for which $kx^2 + 8x + 5 = 0$ has real roots. (3 marks)
- 7 The equation $2x^2 + 4kx - 5k = 0$, where k is a constant, has no real roots.
Prove that k satisfies the inequality $-\frac{5}{2} < k < 0$. (3 marks)
- 8 a Sketch the graphs of $y = f(x) = x^2 + 2x - 15$ and $g(x) = 6 - 2x$ on the same axes. (4 marks)
- b Find the coordinates of any points of intersection. (3 marks)
- c Write down the set of values of x for which $f(x) > g(x)$. (1 mark)
- 9 Find the set of values of x for which the curve with equation $y = 2x^2 + 3x - 15$ is below the line with equation $y = 8 + 2x$. (5 marks)
- 10 On a coordinate grid, shade the region that satisfies the inequalities:
 $y > x^2 + 4x - 12$ and $y < 4 - x^2$. (5 marks)
- 11 a On a coordinate grid, shade the region that satisfies the inequalities
 $y + x < 6$, $y < 2x + 9$, $y > 3$ and $x > 0$. (6 marks)
- b Work out the area of the shaded region. (2 marks)