

Section 2: Inequalities

Exercise level 2

1. Solve the following linear inequalities.

(i) $5(x-3) \leq 2(2x+3)$

(ii) $2(1-x) > 3x+4$

(iii) $4(2x+5) \geq 3(3x-1)$

(iv) $\frac{2x+1}{3} > \frac{x-4}{2}$

(v) $-\frac{1}{2}(4+3x) \geq 2x-1$

(vi) $\frac{x-1}{3} > -\frac{3-x}{2}$

2. In each of the following parts, use a sketch of appropriate quadratic graphs to solve the quadratic inequalities, and indicate on the sketch the values of x which represent the solution.

(i) $x^2 - 5x + 6 < 0$

(ii) $-2x^2 + x + 3 \geq 0$

(iii) $x^2 + 8 < 2x^2 + x + 6$

3. Solve the following quadratic inequalities.

(i) $1 - x - 2x^2 \geq 0$

(ii) $x^2 + 2x - 1 < 0$

(iii) $x^2 \geq 3x + 10$

(iv) $x(x+3) > x+8$

4. Solve the following inequalities.

(i) $\frac{2}{x} \geq 3$

(ii) $\frac{x-2}{x+1} < 1$

5. Show the regions represented by the following inequalities on graphs.

(i) $y > x - 2$

(ii) $y \leq 2x - 3$

(iii) $y \geq x^2 + 1$

(iv) $y < x^2 + 2x - 3$



6. Find the set of values of k for which each of the quadratic equations below have no real roots.

(i) $x^2 - 5x + k = 0$

(ii) $x^2 + kx + k + 3 = 0$