

Linear inequalities

A LEVEL LINKS

Scheme of work: 1d. Inequalities – linear and quadratic (including graphical solutions)

Key points

- Solving linear inequalities uses similar methods to those for solving linear equations.
- When you multiply or divide an inequality by a negative number you need to reverse the inequality sign, e.g. $<$ becomes $>$.

Practice questions

1 Find the set of values of x for which $2x + 1 > 11$ and $4x - 2 > 16 - 2x$.

2 Find the set of values of x for which

(a) $3 + 2x \leq x + 2$

(b) $8x^2 + 10x < 3$

(c) **both** $3 + 2x \leq x + 2$ **and** $8x^2 + 10x < 3$

3 Find the set of values of x for which

(a) $3(2x + 1) > 5 - 2x$,

(b) $2x^2 - 7x + 3 > 0$,

(c) **both** $3(2x + 1) > 5 - 2x$ **and** $2x^2 - 7x + 3 > 0$.

Answers

1 $x > 5$ (which also satisfies $x > 3$)

2 (a) $x \leq -1$

(b) $-\frac{3}{2} < x < \frac{1}{4}$

(c) $-\frac{3}{2} < x \leq -1$

3 (a) $x > 0.25$

(b) $x > 3$ or $x < \frac{1}{2}$

(c) $x > 3$ or $\frac{1}{4} < x < \frac{1}{2}$