# Inequalities

Some people were not great at factorising quadratics in the previous prep, so here are a few nasty quadratic inequalities to get you thinking! (And a couple of higher power polynomials; because I like them.)

1. $4x^2 + 11x - 3 > 0$. $\boxed{x > \frac{1}{4} \text{ or } x < -3}$
2. $4x^2 \leqslant 4x + 3$. $\boxed{-\frac{1}{2} \leqslant x \leqslant \frac{3}{2}}$
3. $6x^2 - 19x + 12 > x^2$. $\boxed{x > 3 \text{ or } x < \frac{4}{5}}$
4. $19x - 5x^2 - 12 > 0$. $\boxed{\frac{4}{5} < x < 3}$
5. $x^2 \leqslant \dfrac{22x + 3}{16}$. $\boxed{-\frac{1}{8} \leqslant x \leqslant \frac{3}{2}}$
6. $7x^2 \geqslant \dfrac{9x - 18}{-2}$.
7. $4x^2 - 10x < x - 2x^2 - 4$.
8. $8x^2 - 4x - 1\frac{1}{2} < 0$.
9. $6\frac{1}{4}x^2 \leqslant 1$.
10. $x^2 - 4x + 4 < 0$.
11. $x(3 - x)(x - 2) \geqslant 0$.
12. $x(x - 3)(x - 7)(x + 2) > 0$.
13. $(2x^2 - 5x - 3)(x + 4) \leqslant 0$.