Two-way algebra

Teacher notes

Why use this resource?

Two-way algebra encourages students to appreciate the different types of solutions that various equations and inequalities can give. Students might have to work backwards from a solution to construct their answers, so there is an opportunity to think carefully about the structure of equations and inequalities. It may also help to develop the thinking of students who have common misconceptions, such as, that a pair of simultaneous equations will always have one solution, or that a quadratic will always have two (real) solutions.

Preparation

There is a large version of the table here that can be printed off for groups to work on.

Possible approach

Students can work in pairs or small groups to try and complete the cells. They should understand that there is not one correct answer to the table, so you may wish to include an opportunity for groups to share ideas and see if they agree with each other.

Key questions

Alongside the questions in the resource, you might ask your students to reflect on:

- Which cells were the easiest to fill in?
- Which cells were the most challenging to fill in?

Possible support

Students may have difficulty working with simultaneous equations with no solutions. Encouraging them to think of the graphs of the equations may help them to understand their answers.

The final column will perhaps be the most unfamiliar idea for the students. They could be asked to leave this out initially, so it can be discussed and completed as a class.

Possible extension

The final question, asks students to decide whether it is possible to fill all the cells with quadratics. This could be done by students sketching graphs to show which they think are possible, or they could try and re-do the table and come up with new examples only using quadratics. It might be a good task to return to at a later date, perhaps as a starting point for teaching quadratic inequalities.