Straight line pairs

Teacher notes

Why use this resource?

Whilst recapping students' knowledge of straight lines, and getting them to think about the links between the equations and geometry of their graphs, this resource also promotes the idea of specialising with simple cases first, before going on to try and generalise your findings. It would be beneficial for students to discuss their approaches, and their reasons for taking them, as there are likely to be varied ideas about how to start the problem.

This could also be a good opportunity to discuss how many solutions a system of equations will give you. Many students may assume there will be a finite number of solutions to this problem. You need to know two pieces of information to draw a straight line graph, and here you appear to be given three. However, understanding that there are 8 ways of combining the information you are given, should help them to understand the structure of the task and why there are multiple solutions for any value of the gradient you choose.

Preparation

Access to graphing software would be helpful.

Possible approach

Students could start working individually or in pairs thinking about approaches to the Main problem.

Key questions

- How could we start? What simplifications can we make?
- How many pieces of information do we need to define a line?
- With 3 pieces of information how many ways can we combine them?

Possible support

Encourage students to start with a very simple line and try to find a pair for it. They might use graphing software and adjust coefficients to try to achieve a solution.

Possible extension

The Taking it further section starts to generalise more. An applet is provided that helps the students to see what the four possible lines could be for each example. However students could also create this applet for themselves, to show their understanding of the constraints given in the question.

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https://undergroundmathematics.org/geometry-of-equations/straight-line-pairs