Lots of vector lines!

Teacher notes

Why use this resource?

This resource invites students to pair lines up according to certain criteria and is a follow on from Lots of lines! (which is the same resource using Cartesian equations). It could be used to introduce, or to develop fluency at working with vector equations of lines. Students have to think carefully about which aspects of the equations allow them to compare two lines to see if they are, for example, parallel. This gives an opportunity to reflect on how the vector form of the equation of a line is different to the Cartesian form.

Preparation

Cards to cut out can be downloaded here if you want students to be able to physically sort the equations. Mini white boards may encourage students to sketch the graphs.

The cards in the problem are interactive so they can be paired up on an interactive white board or tablet.

Possible approach

Students work together as they discuss and select pairs. Encourage the use of correct mathematical language.

Key questions

- Which part of the equation tells us the gradient of the line?
- How do the direction vectors of two perpendicular lines compare?
- Did you make any wrong assumptions? If so did some aspect of the equation mislead you?
- Do you think there are particular features of lines that are easier to spot when the equation is written in vector form compared to Cartesian form?

Possible support

While it is possible to start by comparing equations, encouraging students to sketch the lines will get them to think more carefully about the position and direction vectors of each line.

Possible extensions

- Can you come up with the equation of a line that would match with two different pairs at the same time?
- If the lines were given in three dimensions would you still be able to match up pairs with the same properties? Which properties might be the most challenging to match; parallel, perpendicular, shared x-intercepts, shared y-intercepts or a point of intersection?

The resource could also be used as a way to start talking about the scalar product, particularly when looking at the pair of lines which are perpendicular.