Which parabola?

Teacher notes

Why use this resource?

This problem is good for thinking about how the equation of a parabola relates to its appearance on the graph, and for starting to think about transformations of graphs. As a follow up, students could be invited to create the design (or their own design) online or on a graphical calculator. We've given the link to our design so that teachers can customise it if they wish.

Preparation

Depending on the approach taken access to graphing calculators, a graphing package or Desmos

Possible approach

This problem could be set to motivate the need to move fluently between the forms of the quadratic. Students could work in pairs or groups trying to find the equations.

Later students could return to the task once they have gained confidence manipulating different forms and reflect on the new understanding and techniques they bring to the task. At this later stage it is hoped students would use a variety of knowldege and techniques simultaneously and see the power of the interconnectedness of maths.

Key questions

- What does each form of a quadratic tell you about the graph?
- What does the graph tell you about the quadratic it represents?
- How do changes you make to the quadratic function change the appearance of the graph?

Possible support

Encourage students to think about what different forms of the equation of a parabola tell them. Is one form more helpful than another for this exercise?

Encourage students to make changes to the functions systematically and observe the changes to the graph. For this graphing software would be useful.

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A version of this resource has been featured on the NRICH website. You might like to look at some students' solutions that have been submitted there.

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