That's odd … or even

Teacher notes

Why use this resource?

This problem gives a formal introduction to odd and even functions: students are asked to evaluate functions at 1, -1, 2, -2, and so on, and then asked sketch the functions. Students may start to notice common features when evaluating the functions and then these ideas may be confirmed or refuted when they start to sketch the functions. Formal definitions of odd and even functions are introduced in the 'Things you might have noticed' section and this includes some suggestions of ways of thinking about the definitions.

Possible approach

This could work well in pairs or small groups, with one student evaluating and the other sketching. The task is designed so that students notice symmetry and may start to anticipate values before they are calculated. It is not necessary for students to evaluate all the functions at the given points, but they need to tackle enough of the functions so that when start to work on the last function in each set, they see that it breaks the symmetry.

Students may already be familiar with some of these functions, so they could be prompted to sketch them first and then asked how they can be certain of the symmetry. This may be less easy for the second set of functions.

Key questions

- What did you notice as you sketched the graphs?
- Did your ideas change as you added new graphs to your axes?
- How is the symmetry of the function shown in the graph? How is it revealed by the equation of the function?

Possible support

The task is designed so that all students can start to evaluate the functions for given values of x and build up a sketch graph from these.

Possible extension

Odd or even… or can be used as a follow up to this problem.