

Why use this resource?

This is a great little activity to practise algebra skills and integration together. Students work out the four definite integrals, giving results in terms of the unknowns a , b , c and d whose values can then be determined.

The form of the last integral makes it clear that answers must be integers and it's unlikely that students will get an incorrect integer solution so there is an element of self-checking.

Possible approach

- This works well in pairs or small groups.
- Students might notice that integrals 1 and 3 each contain only one unknown so can be solved independently, perhaps members of a group taking one each. This, along with the self checking nature of the activity due to the form of the last integral, could be brought out at the start of the activity by giving students an opportunity to collectively work out what the rules must be.
- If students cannot find a and c correctly they can swap within their group to spot errors in each others' workings.
- The **Test your solution** part highlights the distinction between an integral and an area.

Key questions

- What does the form of the answer part of integral 4 tell us about a , b , c , d ?
- Is the integral between two limits the same as the area contained between the curve and the x -axis between these two values?

Possible support

The most common errors arise from sign mistakes, so encourage students to check each other's work if they cannot find their own mistakes.

A version of this resource has been featured on the [NRICH website](https://nrich.maths.org/). You might like to look at some students' solutions that have been submitted there.