Order! Order!

Teacher notes

Why use this resource?

This resource asks students to explore and think about combinations of graph transformations. Taking a graphical approach of following a key point on a graph through a sequence of separate transformations, we aim to bring greater understanding of how transformations combine.

Preparation

Students might find it helpful to have mini-whiteboards so they can sketch graphs as they work through the task.

Possible approach

The Warm-up can be used as a whole class activity to refresh ideas of single transformations, or it can be used to introduce the terminology and ideas for the first time. It uses the same transformations as the main problem and introduces a consistent way of describing the transformations algebraically.

Students could work on the main problem in pairs, choosing two of the given transformations and working out the effects they have on the given graph when taken in each order. It is important to allow time for students to consider more than one combination of transformations (there are six possible pairs of transformations in this problem). Findings could be shared with the whole class so that conclusions can be discussed collectively.

Key questions

- What would happen to that point on the graph when you apply this transformation?
- Can you sketch the graph you would get after that single transformation?
- Would the effect be the same for every point on the curve?
- Can you explain why you get a different result this time? What is the same? What is different?

Possible support

The choice of points on the graph to track can be quite important, and students may need help recognising which are better than others in each case. For instance, a point lying on the x-axis will not demonstrate the effect of a vertical stretch!