Inequality flip-flop

Teacher notes

Why use this resource?

The resource is intended to support students' understanding of algebraic manipulation by encouraging them to think in terms of functions. In particular, how applying certain functions to an inequality affects the inequality sign.

The graph in the GeoGebra app shows a function which has many features that cause students difficulty when manipulating inequalities, such as being a decreasing function on some intervals or having an asymptote. This resource offers an opportunity to start discussing increasing and decreasing functions before calculus is introduced.

Preparation

It may be helpful to print copies of the **Problem** sheet so that students have a copy of the graph. They can try to visualise when $f(a) < f(b)$ and when $f(a) > f(b)$. If desired, the GeoGebra app can be downloaded and shared with students.

Possible approach

Once students have attempted parts 1-4, encourage them to make some general observations about increasing and decreasing behaviour of some familiar functions before tackling the statements about the specific functions in parts 5-8.

Key questions

- How does the behaviour of functions affect how you solve inequalities?
- What happens if you square both sides of an inequality?

Possible extension

Ask students to think about how the increasing or decreasing behaviour of functions can affect inequalities if a function is applied to both sides. Students may already have a set of rules or sense of 'safe' and 'unsafe' operations. Can they explain these in terms of the behaviour of functions?