 Other inequalities

Teaching ideas

There are different strategies we can use to solve inequalities with unknown in the denominator. A few are presented here:

1. Multiply both sides of the inequality by the square of the denominator. This doesn’t affect the inequality as the square of anything is always positive. The downside of this strategy is that it can result in long expansions which increase the possibility of errors. The secret to this method is to AVOID expanding and instead FACTORISE where possible.
2. Identify the critical points - where the denominator is zero and any solutions when the inequality is treated as equality. Plot these points on a number line and test regions.
3. Use addition or subtraction to move all terms to one side of the inequality, then create a single fraction with a common denominator and solve using the different cases.
4. Graph and then compare each side of the inequality.

Depending on your students, it can be beneficial to show several methods side-by-side so that students can see which resonates for them. It is also important for students to be able to select the most appropriate method for each problem rather than blindly apply the same strategy. Flexibility is essential for those students wishing to progress to the Extension 2 course.

Syllabus elements

Solving inequalities with unknowns in the denominator.

Teaching resources

This activity uses four different activities to investigate inequalities using Geogebra: <http://gomaths.net/2036> with an accompanying worksheet <http://mths.co/2666>. Note: Java plugin needs to be supported.

This Geogebra worksheet takes students through graphing and comparing each side of the inequality: <http://tube.geogebra.org/m/28197>.