

Why use this resource?

This resource asks students to rationalise and de-rationalise a set of equivalent fractions. This offers plenty of practice at manipulating surds, alongside a chance to notice what multipliers are leading to rational denominators. This allows students the opportunity to draw conclusions about how to rationalise a fraction.

Possible approach

This task could be used as a way to introduce rationalising denominators or to review a student's understanding. The problem could be completed individually before giving students the opportunity to feedback to small groups or the whole class about the method they approached it with, what they have noticed, and any conjectures they have made.

Key questions

- How would you rationalise fractions in the following form: $\frac{a}{\sqrt{b}}$, $\frac{a}{b\sqrt{c}}$ and $\frac{a}{b + \sqrt{c}}$?
- Is there more than one way to rationalise a fraction?

Possible support

If students are having difficulty in moving from one fraction to the next, encourage them to use other fractions in the row to find the numerator (or denominator) and then work backwards to find the multiplier.

They can also check their work by simplifying the fractions at the end of the row and seeing whether they match one of the earlier fractions.

Possible extension

Students could be asked to try and justify any conjectures they have come up with while working on the main problem. They could also think about whether it is always possible to rationalise a fraction. A more complex example might help them get started on this, something like $\frac{3}{2 + \sqrt{2} - \sqrt{3}}$.