

Why use this resource?

This is an open problem offering an opportunity to reinforce the manipulation of logarithms. It can be used to develop fluency with manipulation of logarithms, but it also offers the opportunity to explore logarithms of factorials and to make connections with prime factorisation.

Possible approach

Students might be encouraged to think alone about the problem first for a couple of minutes then pair and share. This could be as a whole class or in groups. They could then work in pairs or fours to investigate the problem. Some time at the end for whole class sharing of results and discoveries would be useful.

Key questions

There are many good questions in the *Some things to think about* section.

Possible support

Students might need to be reminded that they can use rules of logarithms to rewrite different parts.

They might need encouraging to be systematic—changing only one thing at a time and rewriting their sums in a logical order in order to spot patterns.

Possible extension

The final question in the *Some things to think about* section has plenty of scope.

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