Computing the Least Factorial that Multiplies a Rational Number into an Integer.

Given a rational number \( q \), can one compute the smallest possible \( n \) such that \( n!q \) is an integer? This seemingly simple question is deeper than it sounds, and suggests several cute tangential lemmas. The author suggests an algorithm for solving this problem based on rewriting the denominator of \( q \) in base 2, base 3, base 5, base 7, and so forth, up to a certain limit.

The algorithm touches on questions which frequently come up in undergraduate mathematics competitions, such as how many trailing zeroes are found in \( 2014! \), etc... In any case, the talk is meant to be suitable for undergraduates, and only assumes knowledge of modular arithmetic. (Received September 17, 2014)