

1125-VN-1983 **Joshua Zelinsky***, zelinsky@gmail.com. *Integer Complexity and p -Adic Expansions of Rational Numbers.*

Define $||n||$ to be the *complexity* of n , the smallest number of 1's needed to write $||n||$ using an arbitrary combination of addition and multiplication. John Selfridge showed that $||n|| \geq 3 \log_3 n$ for all n , and Guy noted the trivial upper bound that $||n|| \leq 3 \log_2 n$ for all $n > 1$ by writing n in base 2. An upper for almost all n was provided by de Reyna and Jan Van de Lune. We discuss better upper bounds and how further improvements relate to understanding the p -adic expansions of rational numbers of the form $-1/m$ for various m . (Received September 19, 2016)