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Characterizing Primality in Numerical Monoids. Preliminary report.

Numerical monoids, subsets of the natural numbers closed under addition, have numerous applications in various areas of mathematics. While they have been studied extensively, the ω-primality function, which says "how prime" an element is, is a relatively new factorization property. Previously, the ω function was characterized in numerical monoids generated by two elements, while in numerical monoids generated by three elements, examples showing some of the possible orderings of the omega values of the generators were illustrated. Additionally, it has recently been shown that the ω function is eventually quasi-linear in these monoids. While this should allow for easier computation of large values in numerical monoids, the lower bound given was often too large for reasonable computation. In my presentation, I plan to discuss the characterization of the ω function on the generators of numerical monoids generated by three elements, as well as a new lower bound on the eventual quasi-linearity of the ω function. The characterization of the ω function in this case reveals restrictions on the ω function, while the new lower bound allows for the ω function to be easily computed for large values in many numerical monoids. (Received September 08, 2014)