Evan M. O’Dorney* (odorney@college.harvard.edu). Degree asymptotics of the numerical semigroup tree.

A numerical semigroup is a subset Λ of the nonnegative integers that is closed under addition, contains 0, and omits finitely many nonnegative integers (called the gaps of Λ). The collection of all numerical semigroups may be visually represented by a tree of element removals, in which the children of a semigroup Λ are formed by removing one element of Λ that exceeds all existing gaps of Λ. In general, a semigroup may have many children or none at all, making it difficult to understand the number of semigroups at a given depth on the tree. We investigate the problem of estimating the number of semigroups at depth $g$ with $h$ children, showing that as $g$ becomes large, it tends to a proportion $\varphi^{-h-2}$ of all numerical semigroups, where $\varphi$ is the golden ratio. (Received September 25, 2012)