

1014-60-1444

Kyle T Siegrist* (siegrist@math.uah.edu), Department of Mathematical Sciences, University of Alabama in Huntsville, Huntsville, AL 35899. *Random, Finite Subsets with Exponential Distributions*. Preliminary report.

Let S denote the collection of all finite subsets of \mathbb{N}_+ . We define an operation on S that makes S into a positive semigroup with set inclusion as the associated partial order. Positive semigroups are the natural home for probability distributions with exponential properties, such as the memoryless and constant rate properties. We show that there are no exponential distributions on S , but that S can be partitioned into sub-semigroups $S_k = \{x \in S : \max(x) - \#(x) = k\}$, $k \in \mathbb{N}$, each of which supports a one-parameter family of exponential distributions. We then find a two-parameter family of distributions on S that are close to exponential, in a strong sense. This work may have applications to the problem of selecting a finite sample from a countably infinite population in the most random way. (Received September 28, 2005)