DISCRETE SEMI-STABLE DISTRIBUTIONS

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Abstract. The purpose of this paper is to introduce and study the concepts of discrete semi-stability and geometric semi-stability for distributions with support in Z_+. We offer several properties, including characterizations, of discrete semi-stable distributions. We establish that these distributions possess the property of infinite divisibility and that their probability generating functions admit canonical representations that are analogous to those of their continuous counterparts. Properties of discrete geometric semi-stable distributions are deduced from the results obtained for discrete semi-stability. Several limit theorems are established and some examples are constructed.

Key words and phrases: Stability, geometric stability, infinite divisibility, discrete distributions, weak convergence.