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Melanie E. Wood* (mew2@duke.edu), 2639 Andy Drive, Indianapolis, IN 46229. *P-orderings: the metric viewpoint and the non-existence of simultaneous orderings in imaginary quadratic number rings.*

We investigate P -orderings of arbitrary subsets X of a Dedekind ring R , which are used to generalize the notion of “factorial” to a more abstract setting. Many classical number theoretical results can be extended to Dedekind rings using generalized factorials, and in this paper, we consider P -orderings from the viewpoint of the P -adic metric on R in order to develop several results that help find P -orderings and thus generalized factorials. It turns out that the P -orderings of X depend on the closure of X in \hat{R}_p . When R' and R are Dedekind Domains and R' is the integral closure of R in a finite, separable extension of the fraction field of R , we can relate the P -orderings of R and R' . We examine the idea of P -ordering “primes” in a PID number ring. Lastly, we investigate orderings that are simultaneously P -orderings for all prime ideals $P \subset R$, and show that these simultaneous orderings do not exist for imaginary quadratic number rings, a result that is conjectured for all number rings other than the integers. (Received September 29, 2000)