1106-05-1034 **Christopher Coscia*** (cosciach@bc.edu) and **Jonathan DeWitt**. *Locally Convex Words and Permutations.*

Define a *k-convex permutation* $\pi : [n] \to [n]$ to be a bijection obeying the condition $2\pi(i) \geq \pi(i-1) + \pi(i+1) - k$ for all $i \in \{2, 3, \ldots, n-1\}$ for fixed $k \geq 0$, and denote the number of k-convex permutations of length n by $f_k(n)$. We attempt to determine $f_k(n)$ for $k = 0, 1$, and 2, cases under which these permutations satisfy nice properties; in particular, they are consecutive 213 and 312 avoiding. We show that $f_0(n)$ is precisely 8 for $n > 4$ and demonstrate, for $k = 1, 2$, a method of exhaustively constructing k-convex permutations. We contruct an infinite "descendant digraph" for $k = 1$ and $k = 2$, and use the transfer matrix method with generating functions to determine $f_1(n)$, give a partial solution for $f_2(n)$, and demonstrate that it is possible to give arbitrarily tight exponential bounds in both cases.

Similarly, we define *k-convex words on a p-alphabet* to be functions $g : [n] \to [p]$ satisfying $2g(i) \geq g(i-1) + g(i+1) - k$ for all $i \in \{2, 3, \ldots, n-1\}$. We demonstrate that it is possible to find a generating function $G_{p,k}$ for any values of p, k, and show that the number of 0-convex words is eventually constant in n for any p, giving an expression for this constant in p related to the integer partition numbers. (Received September 09, 2014)