Problem 4 (due Monday, March 30)

Let $p>2$ be an odd prime number. Integers $a_1,a_2,\ldots, a_{p+1}$ in the interval $[0,p]$ have the following property: for every permutation π of the set $\{1,2,\ldots,p+1\}$ the number \[\sum_{k=1}^{p+1}ka_{\pi(k)}\] is not divisible by p. Prove that $a_1=a_2=\ldots=a_{p+1}$.

Ashton Keith, a freshman majoring in math, is the only person who solved the problem. His solution is based on a different idea than our solution. Both solutions are discussed in the following link Solution