

Idea of the construction of $\mathbf{p}_k(n)$, cont

Let $f(n, k)$ be the probability that $k \mid (a + b)$ and $(b + c)$ for a random abc -permutation of length n .

Lemma (Pak-Redlich, 2008)

$$f(n, k) = \begin{cases} \frac{\left(\frac{n}{k}+1\right)\left(\frac{n}{k}+2\right)}{(n+1)(n+2)} & \text{if } k \mid n \\ \frac{\lfloor \frac{n}{k} \rfloor (\lfloor \frac{n}{k} \rfloor + 1)}{n(n+1)} & \text{if } k \nmid n. \end{cases}$$