Name: _____

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1. A permutation p is called a nontrivial involution if $p^2 = 12\ldots n$, but $p \neq 12\ldots n$. Prove that if $n > 1$, the number of nontrivial involutions in S_n is odd.

2. Find an explicit formula for $c(n, n - 3)$.

3. Let p be a permutation of the cyclic type $(c_1, \ldots, c_n)$. Show that $p^\ell = 123 \ldots n$, where

$$\ell = \prod_{i \ : \ c_i \neq 0} i.$$