

MATH 579 Exam 6; 10/29/13

Please read the exam instructions.

No books or notes are permitted for this exam; calculators are permitted though. Please indicate what work goes with which problem, and put your name or initials on every sheet. Cross out work you do not wish graded; incorrect work can lower your grade, even compared with no work at all. Show all necessary work in your solutions; if you are unsure, show it. Simplify all numerical answers to be integers, if possible. You have 40 minutes. If you wish, when handing in your exam you may attach your extra credit problem. For more details, see the syllabus.

Choose three problems only from these five.

1. (5-8 points) Let $\pi = (2\ 3\ 5)(1\ 4)$, $\sigma = (3\ 4\ 6\ 1)(2\ 5)$. Calculate $\sigma \circ \pi$, $\pi \circ \sigma$, and π^σ .
2. (5-10 points) Calculate how many permutations on $[n]$ have 1, 3 in the same cycle, but 2 in a different cycle.
3. (5-10 points) Calculate how many permutations on $[n]$ have 1, 3 forming a cycle of length 2, and 2 in a different cycle of length 2.
4. (5-10 points) Find a formula involving $p(n)$ for the number of partitions of n in which the three largest parts are equal.
5. (5-12 points) Calculate how many permutations $p \in S_6$ satisfy $p^6 = 1$.