

Problem Set 13

Problem Set 13 is due by the end of class on Friday, March 2, or using a free makeup, by the end of class on Monday, March 5.

Problems marked “MATH 504” should be done only by MATH 504 students. MATH 345 students will not get credit for doing them. The other problems should be done by everyone.

1. Do the following permutation computations, performing any multiplications from right to left. Express your answers in disjoint cycle form.

(a) $(5\ 1\ 4\ 3)^2$.

(b) $(1\ 2\ 4)^{-1}(6\ 2\ 4\ 1)$.

(c) $(2\ 4\ 8\ 5)^{103}$.

(d) $((2\ 3\ 6)(1\ 3\ 4))^2$.

2. Find the order of the following permutations. Multiply permutations from right to left.

(a) $(5\ 1\ 3\ 7)$ in S_7 .

(b) $(1\ 6)(5\ 2\ 3\ 4)$ in S_6 .

(c) $(1\ 3\ 2\ 5)(1\ 4\ 2\ 3)$ in S_5 .

[MATH 504]

3. Give a specific element of S_6 which:

(a) Is a product of two disjoint cycles and has order 3.

(b) Is a product of two disjoint cycles and has order 4.

(c) Has order 2, but does not leave any of $\{1, 2, 3, 4, 5, 6\}$ fixed.