

MAS 3203 — Introduction to Number Theory — Spring 2007

Detailed Syllabus and Homework Assignments

Nothing in this document is etched in stone. Although I expect most of what is here to remain, as the semester progresses I may make changes. These changes could include the sections covered, problems assigned, problems collected, and material covered by exams. In order to allow for questions, there always will be at least one class day between any material covered and its treatment on an exam. The problems marked with an asterisk are the ones to be handed in. Each line corresponds roughly to one day of class, but we will not be confined to this.

Section Homework

1.1 Math induction	P6: 1ae,2,3,5,9,11,13
2.1 Early number theory	P15: 1bc,4,10,11a
2.2 Division algorithm	P19: 1,*3b,6,11 (Sections 2.1, 2.2 treated on same day)
2.3 Greatest common divisor	P24: 2bcd,3,4c,5,8b,12,*13b,14b,18(first part),20c,21,23
2.4 Euclidean algorithm	P31: 1,2ad,4b,5b,6,9,*10a
3.1 Fund thm of arithmetic	P43: 3ce,4,6bd,9,10,11,12,*15,17
3.2 Sieve of Eratosthenes	P49: 1,2,3,*4a,5,8,10,12b

Exam 1 on Sections 1.1, 2.1, 2.2, 2.3, 2.4, 3.1

3.3 Goldbach conjecture	P57: 3,5,6,8(60 only),*9a(why $n > 3$?),11(f(n) only),13
3.3 Goldbach conjecture	P57: 15(1 set only),17(509 only),18a,19(69 only),20,*21,23b,26ab
4.1,4.2 Prop of congruence	P67: 1,2,3,4b,6c,8bd,*10,12a,13,14,17
4.3 Binary/decimal rep of int	P73: 1(141 ⁴⁷ only),5ab,9,11,13,16,*19,22,25,26
4.4 Chinese remainder thm	P.82: 1bdf,4bd,5,*8,10,11,12,17,18,20b

Exam 2 on Sections 3.2, 3.3, 4.1, 4.2, 4.3

1.2 Binomial theorem	P10: 1,3abcd,4c,*5a,6,8,9,10
5.1,5.2 Fermat's little thm	P92: 1,2b,4a,*6a,8,11b,12,15a(see Prob 21, Sec 2.3),16a,17
5.3 Wilson's theorem	P96: 1b,3,*7,10a,11,14,15
5.4 Factorization method	P102: 1c,*3,4,5c,8
6.1 Sum/number of divisors	P110: 1,2,3,4,*6,7a,8,9

Exam 3 on Sections 4.4, 1.2, 5.1, 5.2, 5.3, 5.4

6.1 Sum/number of divisors	P110: 12a,14ab,15(first part only),16b,*18,19(product only),20b
6.2 Möbius inversion formula	P116: 1,2,*3,4a,7
7.1,7.2 Euler's phi-function	P135:1(1001 only),4abc,5,*8,11a,13,16
7.3 Euler's theorem	P140: 1a,2,3,*5,7,8a,9,11c
14.1,14.2 Fibonacci sequence	P291: 1(13 only),4,*5,10,12,14,16

Exam 4 on Sections 6.1, 6.2, 7.1, 7.2, 7.3

14.3 Identities-Fibonacci nos	P299: 1b,2a,3,6a,*9,11,17d,18a
10.1 Public key cryptography	P206: 2,3,4,5,6,7
11.1,11.2 Perfect numbers	P224: 1,2a,3,4,5

Comprehensive Final Examination April 30, 2007, 4:00 – 6:50 (as indicated in official schedule)