Number Theory. Program 2000/2001.

January 7, 2021

Chapter 1. **Divisibility**

1.1 Polygonal numbers.

1.2 Divisibility.

1.3 The existence of infinitely many prime numbers.

1.4 Arithmetic functions.

1.5 Generating functions.

Chapter 2. **Congruences**

2.1 Definition and properties.

2.2 Linear congruences.

2.3 Simultaneous congruences.

2.4 Polynomial congruences. Lagrange's Theorem.

2.5 Quadratic residues.

2.6 Legendre and Jacobi symbols.

2.7 Quadratic reciprocity law.

2.8 Primitive roots.

Chapter 3. **The distribution of prime numbers.**

3.1 Erathostenes' sieve.

3.2 The functions $\pi(x)$, $\psi(x)$ and $\theta(x)$.

3.3 Tchebychev's Theorem.

3.4 Bertrand's Postulate.

3.5 Mertens' Formulae.

References

[1] K. Chandrasekaran, Introduction to analytic number theory, Springer-Verlag, Berlin 1968.

[2] J. Cilleruelo y A. Córdoba, La teoría de los números, Mondadori, Madrid, 1992.

[3] H. Davenport, Multiplicative number theory, Springer-Verlag, New York, 1980.

[4] L. K. Hua, Introduction to number theory, Springer-Verlag, Berlin, 1982.

[5] J. Jiménez, La función zeta de Riemann; Conjeturas, Tesina, U.A.M. 1993.

[6] Halberstam and Richert, Sieve Methods, Academic Press, Londres, 1974.