

Elementary number theory

- Divisibility, Euclidean algorithm, congruences, residues
- Primes, heuristics concerning the distribution of primes
- Fermat's Little Theorem $a^p = a \pmod{p}$
- Primes $\equiv 1 \pmod{4}$ as sums of squares
- Euler function $\varphi(m)$, multiplicativity, $\sum_{d|m} \varphi(d) = m$
- $(\mathbb{Z}/p\mathbb{Z})^\times$ is cyclic, primitive roots
- Integral and fractional part, computing p -powers in $n!$
- Legendre symbol, quadratic reciprocity via Gauss sums
- Outlook: some open problems