1. Reading: D. Kozen *Automata and Computability*, lectures 38, 39

2. The main message of this lecture:

> **The set of theorems of any formal theory is recursively enumerable. The set of all valid formulas of arithmetic is not recursively enumerable. Therefore, the number theory (as well as mathematics in general) cannot be completely axiomatized.**

We will follow Lectures 38 and 39 in Kozen's book closely.

Homework problem 35.1. Write in the language of number theory (p.282-283 on Kozen's book) a formula saying that there are infinitely many primes p such that $p + 2$ is also a prime.

Homework problem 35.2. Write in the language of arithmetic the property "x is a power of some prime integer".