

## Homework 6

- ① The Parallel Axiom cannot be proved using any of the other four axioms because it is completely independent from them. When looking at the proof of the Parallel Axiom, one can tell that it requires a different branch of non euclidean geometry. It needs to be proved with Hyperbolic Geometry's Axioms.
- ② Gödel's work, the theorems of incompleteness, state it is impossible to have one complete set of axioms that is always consistent and can prove any theorem or axiom regarding natural numbers. Thus, we may find something to be true, but the proof may not be possible.
- ③ Dr Z's opinion 125 states that there is something wrong with Gödel's famous theorem. Infinity is the flaw. Turing's infinite tape says  $N$  can be any positive integer where the program halts. Dr Z says it stops at  $M$  where  $M$  is a finite set.
- ④ (i) A is liar, B is truth teller OR A is truth teller, B is liar  
(ii) None possible  
(iii) None possible  
(iv) A + C liars, B + D truth tellers OR A + C truth tellers, B + D liars