

## HW6

Sunday, October 3, 2021 7:21 PM

1. Explain, in your own words, why you **can't** prove the Parallel axiom using the four other axioms.

The big thing is that it is independent from the other postulates. Also, it cannot be drawn, not really at least.

2. Explain in your own words, the general idea behind Gödel's proof that there exist true but unprovable mathematical statements.

The general idea is that some statements create paradoxical situations that are neither true nor false, and cannot be determined. One example is 'This statement is unprovable'.

3. Carefully read

<https://sites.math.rutgers.edu/~zeilberg/Opinion125.html> .

Explain in your own words, Dr. Z.'s version of Gödel's famous theorem (and Turing's undecidability of the Halting Problem).

Long story short, Gödel's theorem is flawed b/c of the fictional idea of 'infinity'. Same w/ the Halting Problem, it is nonsense to think of an 'infinity'.

4. What possible scenarios (if any!) are there for each of the following.

(i) Two people,  $A$  and  $B$ .

$A$ :  $B$  is a Lie-Teller

$B$ :  $A$  is a Lie-Teller

- $A$  is telling the truth,  $B$  is lying
- $B$  is telling the truth,  $A$  is lying

(ii) Two people,  $A$  and  $B$ .

$A$ :  $B$  is Truth-Teller

$B$ :  $A$  is a Lie-Teller

- No possible scenario

(iii) Three people,  $A, B, C$

$A$ :  $B$  is a Lie-Teller

$B$ :  $C$  is a Lie-Teller

$C$ :  $A$  is a Lie-Teller

- No possible scenario

(iv) Four people,  $A, B, C, D$

↑  $A$ :  $B$  is a Lie-Teller

↓  $B$ :  $C$  is a Lie-Teller

↑  $C$ :  $D$  is a Lie-Teller

↓  $D$ :  $A$  is a Lie-Teller

- $A, C$  are truth,  $B, D$  are lying
- $B, D$  are truth,  $A, C$  are lying