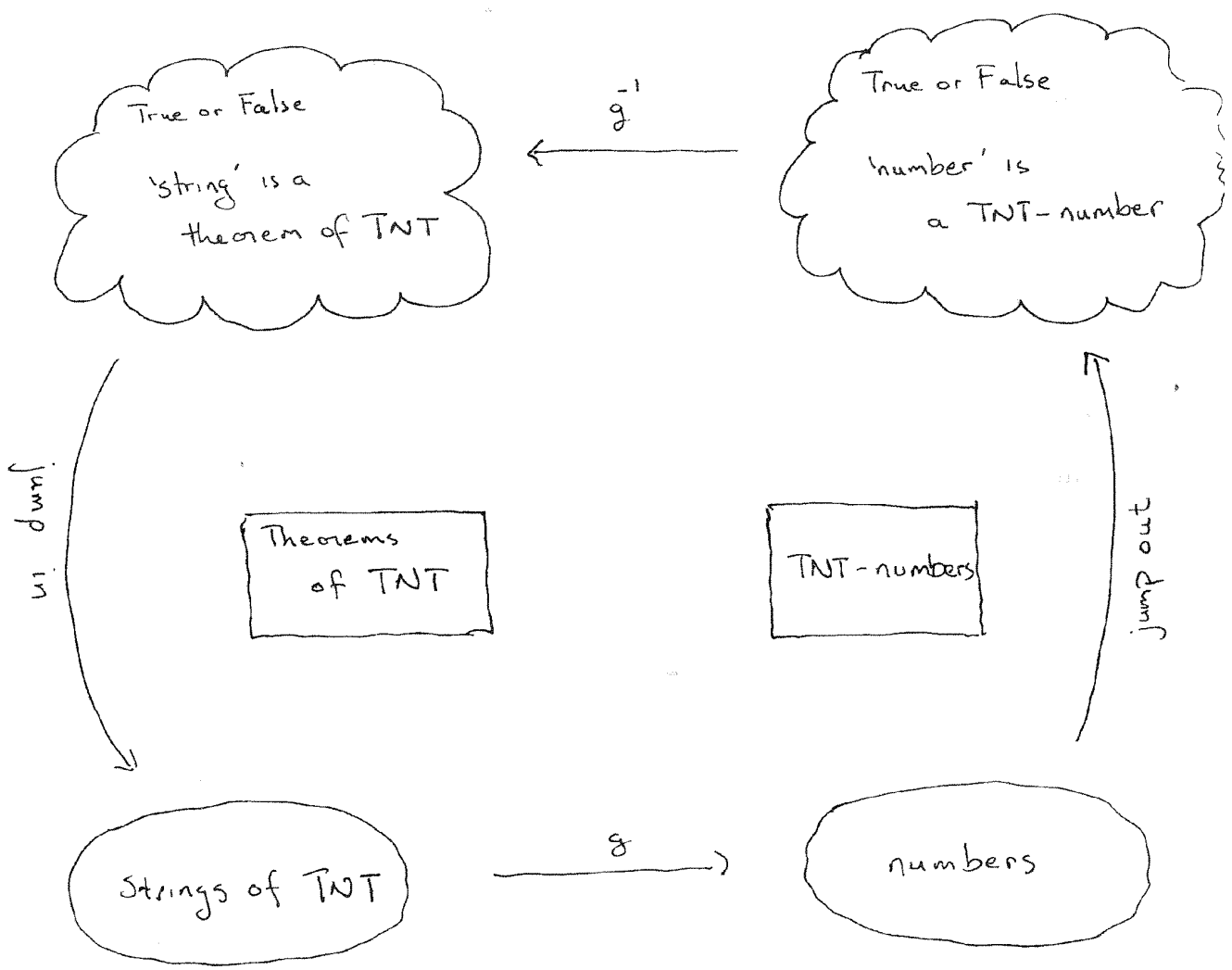


In my last communication I discussed how we could produce a spiral-like object from a string of TNT labelled H. Here is a pictorial representation based on a previous handout. The spiral starts at bottom left.



To see the spiral, recall that we start with a string of TNT called H .

(let's forget briefly that we want to answer a true-false question about H)

OK, so the Gödel numbering dictionary on page 268 can be used to convert H into a number, call it $g(H)$.

Now let's jump out of the set of numbers and into number theory, asking the question "True or False: $g(H)$ is a TNT-number"

Recalling that the TNT-numbers come from the numbers $g(\text{Axiom 1}), g(\text{Axiom 2}), \dots, g(\text{Axiom 5})$ by means of some arithmetic rules, we see that our question ~~is~~ really asks whether the number $g(H)$ can be written in a certain form.

That form involves certain variables, and essentially we want to know whether certain equations involving the number $g(H)$ and these variables have solutions.

g^{-1} then converts this question about existence of solutions to a question about a string of form " $\exists k: \exists m: \exists n:$ equations involving $g(H)$ hold "

More or less directly, we take this question and jump right into TNT again with

" $\exists a: \exists a': \exists a''$ " ... "

This string of TNT, which came to us from H, might be labelled

$$\text{jin} \left(\bar{g}' \left(\text{jout} \left(g(H) \right) \right) \right).$$

Basically you just follow the arrows around counter clockwise.

Note that the resulting string is different from H ~~is~~ and "talks about" H in the sense described by Hofstadter.

The process can be repeated, leading to a "spiral".

Gödel's thoughts about the spiral effect might have been as follows.