# Proofs and Programs

April 16, 2018

0. Which of the following propositions are *constructively true*:

- The first digit of $\pi$ is 3 or the winning numbers this weekend will be 3, 14, 21, 25, 34 and 35.

- $2^{123456789} - 1$ is odd and the winning numbers this weekend will be 3, 14, 21, 25, 34 and 35.

- Every program which loops never stops.

1. Critically discuss the following concepts: "correctness of an algorithm", "the correctness of a program".

2. Contrast the notions of "theorem", "model", "thesis".

3. Comment the following statement:

D. Zeilberger: The real work of us mathematicians, from now until, roughly, fifty years from now, when computers won't need us anymore, is to make the transition from human-centric math to machine-centric math as smooth and efficient as possible.

4. Comment the following statement:

D. Knuth: . . . programming demands a significantly higher standard of accuracy. Things dont simply have to make sense to another human being, they must make sense to a computer.