2) (10 pts) ANL (Algorithm Analysis)

You are using an algorithm that can multiply 2 N-digit integers in $O(N^{1.5})$ time. It takes $(10/13)^3$ seconds to multiply 2 numbers that have 100,000 digits. What is the expected number of digits of 2 numbers we could multiply together that would take exactly 1 second? **Please show all your work, including algebraic simplification, which is part of what is being tested with this question.**