1 Problem 5

$$l(a) = \begin{cases} 0 & \text{if } a = 1 \\ 1 + l(f(a)) & \text{otherwise} \end{cases}$$

where

$$f(a) = \begin{cases} 1 & \text{if } a = 1 \\ \frac{a}{2} & \text{if } a \text{ is even} \\ 3a + 1 & \text{othewise} \end{cases}$$

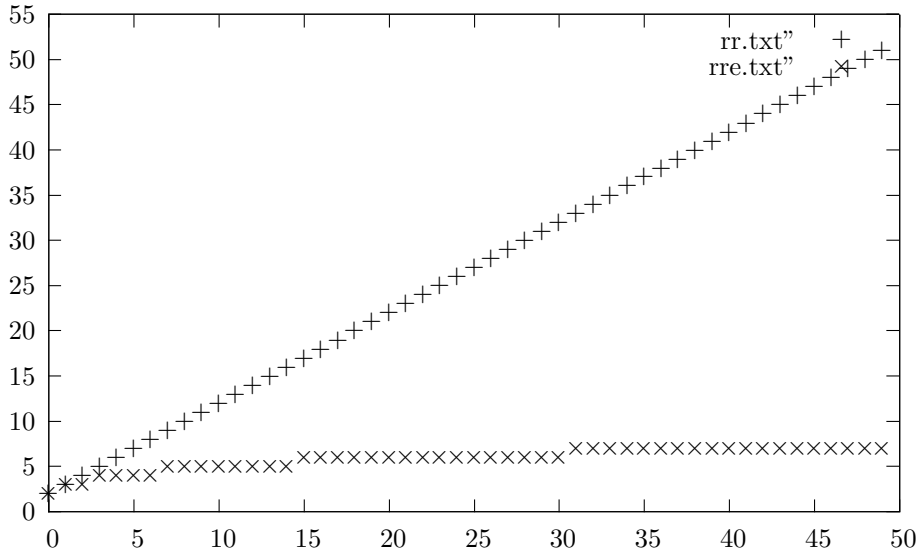
2 Problem 7

There are two scenarios where the function does not converge to 1. The first one is that the function converges to some other number or loop. That would mean that my program would loop forever i.e. until user termination.

The other scenario is that the function diverges. And in that case my program would suffer integer overflow. The value of the integer would become negative and that would mess up the series.

3 Problem 10

1. I think it is the size of k. This is because k is the variable iterated over and x is not.
2. derp.
3. I think that $N_1(k)$ is linear.
4. I think that $N_2(k)$ is logarithmic.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