CS 205: Homework Set 7 $\hfill$ 16:198:205

Complete each of the following problems to the best of your ability. Remember, you can't be graded on what you don't write down so (unless you are just making stuff up) something is better than nothing. Discussing problems between each other is fine, but your final writeup and work must be your own. *Note: This homework asks for proofs, not just computation.*

   1) How many digits does $2^{10,000,000,000,000}$ have?

   2) What are the last two digits of $2^{10,000,000,000,000}$? Prove it.

   3) Prove it a different way.

Bonus: What is the first digit of $2^{10,000,000,000,000}$? Prove it.