Numerics Practice Problems

1. Decide whether these statements are **True** or **False**. You must briefly justify all your answers to receive full credit.

    (a) Multiplication of two d-digit integers can be performed in time $O(d^{1.01})$.

    (b) It would be feasible, using the program demonstrated in class for computing to millionth digit of $\sqrt{2}$, to compute the ten-millionth digit of $\sqrt{2}$ within a class period.

    (c) Newton's Method can be used to compute a zero for any continuous function.

    (d) Karatsuba's method for multiplying integers is an example of the "Divide-and-Conquer" paradigm.

2. When computing $\sqrt{2}$ using Newton's Method, some values of x_0 (the "initial guess") cause Newton's Method not to converge to the desired value. Give an example of one such "bad initial guess", and explain why it is "bad".