Name _____

CSCI 332, Fall 2025
Quiz 3

1. (4 points)

   Order the following functions from asymptotically smallest to asymptotically largest. If two functions are asymptotically equal (one is Θ of the other), indicate this with an equals sign. For example, if the functions were n, n^2, and $3n+4$, the answer would be $n = 3n+4 < n^2$.

   - 3^n
   - 5^n
   - $\sqrt{n}$
   - $501n^2$
   - $\log_2 n$
   - $100^{100!}$
   - $0.5n^2 - 50n$

2. (4 points) For each of the following choices of n_0, c indicate whether they could be used to to prove that $3n^2 + 3$ is $O(n^2)$.

   (a) $c = 1, n_0 = 3$. Yes or no?

   (b) $c = 4, n_0 = 0$. Yes or no?

   (c) $c = 4, n_0 = 10$. Yes or no?

3. (3 points) There is an algorithm with best-case runtime that is $\Omega(n^2)$ and worst-case runtime that is $\Omega(n)$. True or false?