CSCI 305, Homework # 2

YOUR NAME HERE

Due date: Tue, May 1, midnight

In all cases, we require that $f(n)$ and $g(n)$ be positive functions, *i.e.* $f(n) > 0$ and $g(n) > 0$ for all $n > 0$. Prove or disprove each of the following conjectures.

1. $f(n) = O((f(n))^2)$

$$f(n) < c(f(n))^2)$$
$$c = 1$$
$$f(n) =< f(n) * f(n)$$

   Provided the result of f(n) is equal to or greater then 1 this is always true

2. $f(n) = \Theta(f(n/2))$

3. $f(n) + o(f(n)) = \Theta(f(n))$

4. If $f(n) = O(g(n))$ then $f(n) + g(n) = O(f(n))$.
   Suppose $f(n) = O(n)$ and $g(n) = O(n^2)$
   $f(n) = O(g(n))$ would be true,
   but $f(n) + g(n) = O(f(n))$ would not be true because $g(n) < f(n)$.