Homework 3

Due Monday, July 23rd at 11:59pm

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Problem 1: Big-O Notation.

$$f(n) = 10^6 * n^2 + 10^8 * n^{1.5} + n^3 + 10^{10} * n^{2.99} \leq 10^6 * n^3 + 10^8 * n^3 + n^3 + 10^{10} * n^3 \text{ for all } n \geq 1.$$
$$= (10^6 + 10^8 + 1 + 10^{10})n^3$$

Thus there exists a $c = (10^6 + 10^8 + 1 + 10^{10}) > 0$ and an $n_0 = 1 > 0$ such that for all $n \geq n_0 = 1$, $f(n) \leq c * n^3$. Thus $f(n)$ is dominated by n^3 and thus $f(n) \in O(n^3)$.