Exercise 2.2-1:

Let $f(n) = \frac{n^3}{1000} - 100n^2 - 100n + 3$

Let $g(n) = \frac{n^3}{2000}$

$\because \exists M \in N^*, \forall n > M, f(n) > g(n)$

Let $h(n) = \frac{n^3}{1000}$

$\because \exists M \in N^*, \forall n > M, f(n) < h(n)$

$\therefore \exists M \in N^*, \forall n > M, g(n) < f(n) < h(n)$

$\therefore f(n) = \Theta(n^3)$