CSE 6331 Homework 2

Due: Tuesday, January 23, by class time

We proved the following theorem in class.

Theorem 5. If $T(n)$ is asymptotically nondecreasing and $f(n)$ is smooth, then $T(n) = O(f(n)|n$ a power of $b)$ implies $T(n) = O(f(n))$.

1. Show that Theorem 5 would not hold if $T(n)$ is not asymptotically nondecreasing. (Give a counterexample.)
2. Show that Theorem 5 would not hold if $f(n)$ is nondecreasing but not smooth (even if $T(n)$ is asymptotically nondecreasing) . (Give a counterexample.)
3. Prove **Theorem 6:** If $T(n)$ is asymptotically nondecreasing and $f(n)$ is smooth, then $T(n) = \Omega(f(n)|n$ a power of $b)$ implies $T(n) = \Omega(f(n))$.