# 15-251: Great Theoretical Ideas In Computer Science

## Recitation 4

## $\mathcal{O}$, I Think I Understand Asymptotics Now

Let $f, g, h$ be functions from $\mathbb{N}$ to $\mathbb{N}$. Prove or disprove the following:

(a) If $f \in \mathcal{O}(g)$ and $g \in \mathcal{O}(h)$, then $f \in \mathcal{O}(h)$

(b) If $f \in \mathcal{O}(g)$, then $g \in \mathcal{O}(f)$

(c) For all $k \in \mathbb{R}^+$, $\log(n) \in \mathcal{O}(n^k)$.

## Odd-Paz

State and prove a divide-and-conquer procedure for proportional cake cutting between any number of players. (The Even-Paz algorithm as described in lecture is an excellent starting point.)