CSC 165

polynomials, non-polynomials

week 8, lecture 3

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how to prove $n^4 \notin \mathcal{O}(3n^2)$

$$\forall c \in \mathbb{R}^+, \forall B \in \mathbb{N}, \exists n \in \mathbb{N}, n \geq B \wedge n^4 > c3n^2$$

scratch

non-polynomials

You can use calculus tools such as L'Hôpital's Rule
to show one function bounds another (later).
But induction will also work.

$P(n) : 2^n \geq 2n$

The claim checks out for the first few natural numbers $n = 0, 1, 2, \ldots,$
and we can see a way to connect $P(n)$ to $P(n+1)$, so it's likely true
for all natural numbers n

$P(n) : 2^n \geq 2n$

Prove: $\forall n \in \mathbb{N}, P(n)$.

scratch

eventually true:

$P(n) : 2^n > n^2$

scratch