Lecture 3

Monday, October 1, 2018 1:10 PM

Lemma For any $x > 0$, $\log n \le n^x$ for large enough n

(Updated the proof after lecture)

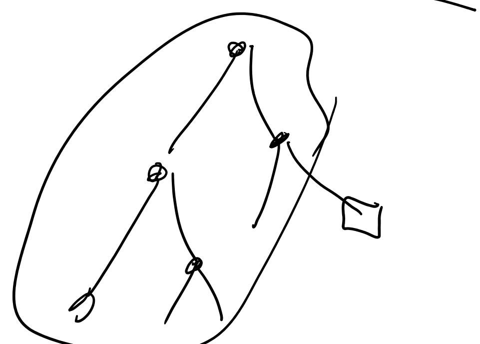
Pf: $\lim_{n \to \infty} \frac{\log n}{n^x} = \lim_{n \to \infty} \frac{\frac{1}{n}}{x n^{x-1}} = \frac{1}{x} \lim_{n \to \infty} \frac{1}{n^x}$

L'Hospital Rule

$= 0$

Thm Every tree with n vertices has exactly $n-1$ edges.

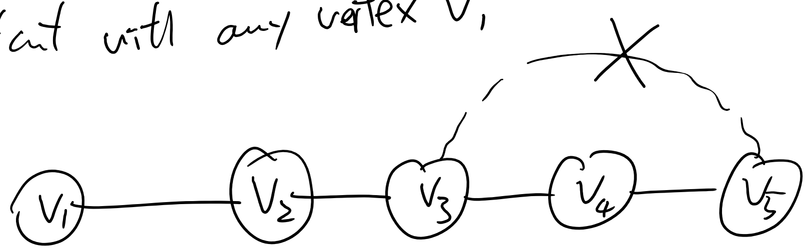
Lem If G has no cycle, $\exists\, v$ st $\deg(v) \le 1$



Call vertex with $\deg = 1$ as leaf

Pf by construction

start with any vertex V_1



Continue a path start from V_1 to V_2 - - - -

until $\deg(V_i) \le 1$

Since there is no cycle, every step discover a new vertex

Since there only n vertex, so, it terminates in n steps

Since there only n vertex, so, it terminates in n step.