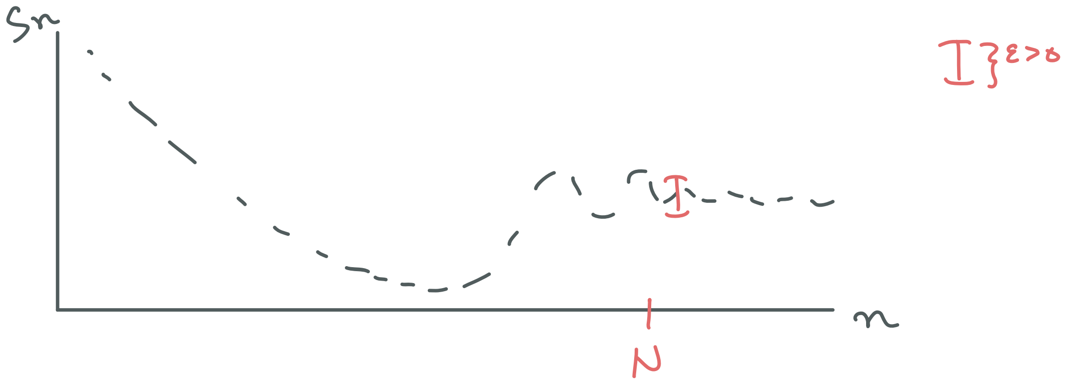
Lecture 10 - Highlights

Def (Cauchy sequence): A sequence s_n is a **Cauchy sequence** if

for all $\varepsilon > 0$, there exists $N \in \mathbb{R}$ s.t. $m, n > N$ ensures $|s_n - s_m| < \varepsilon$



Lemma: Convergent sequences are Cauchy sequences

Lemma: Cauchy sequences are bounded.

MAJOR THEOREM #4

Thm: A sequence is convergent iff it is Cauchy.

Here you must know what the limit is and show elts of sequence get close to it.

Here you must know that elts of sequence "bunch up". (Don't need to know what they are bunching up around)

Types of Sequences:

	MONOTONE	NOT MONOTONE	
BOUNDED	$s_n = \frac{1}{n}$	$s_n = \frac{(-1)^n}{n}$	$s_n = (-1)^n$
UNBOUNDED	$s_n = n^3$	$s_n = \begin{cases} (-1)^n & n \leq 4 \\ n & n \geq 5 \end{cases}$	$s_n = (-1)^n n$

CAUCHY SEQUENCES

$\Updownarrow$

CONVERGENT SEQUENCE

DIVERGE TO $+\infty$ OR $-\infty$

THE LIMIT EXISTS