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Math 301

Assignment 1

Suppose that　 is a finite sequence of real numbers and that is a positive integer where . A term will be called an if there exists a positive integer and such that Thus, for instance, the are the nonnegative terms of the sequence; observe, however, that if then an need not be nonnegative.

Lemma. The sum of the is nonnegative.

If there are no, then the assertion is true. Otherwise, let be the first and let be the shortest nonnegative sum it leads (here, We assert that every If not, then Proceed now inductively with the sequence the sum of the shortest nonnegative sums so obtained is exactly the sum of the

Individual Ergodic Theorem. If is a measurepreserving (but not necessarily invertible) transformation on a space (with possibly infinite measure) and if then

converges almost everywhere. The limit function is integrable and invariant (i.e., almost everywhere.) If , then