

# Analysis I – Week 4 Review

1. Can you explain to a fellow student what a sequence is?
2. In what ways can a sequence be represented. What are the ups and downs?  
(Not only the list of a finite number of elements has downs, they all do.)
3. Without looking in the notes, can you recall the following definitions
  - (a) Bounded set
  - (b) Supremum of a set
  - (c) Infimum of a set
  - (d) Bounded sequence
  - (e) (Strictly) Increasing sequence
  - (f) (Strictly) Decreasing sequence
  - (g) Subsequence
  - (h) What does it mean that a sequence tends to infinity?

4. Write down a couple of sub-sequences for the sequence  $(a_n)_{n \in \mathbb{N}}$ , where

$$a_n := \frac{n^2 + 1}{n + 1}.$$

Can you then give explicit formulas for  $a_{n_k}$  for your choice of  $(n_k)_{k \in \mathbb{N}}$ ?

5. Can you explain the concept of a sub-sequence to a fellow student?
6. Can you construct a definition of a supremum of a sequence? If so, you surely can say what an infimum would be. Does the infimum/supremum of a sequence necessarily belong to the sequence, i.e. is there an index  $n_0 \in \mathbb{N}$  such that  $\sup((a_n)) = a_{n_0}$ ?
7. Did you know that you can use [Wolfram alpha](#) to draw graphs of you favourite sequence and any other?
8. Do you know that you can get help with Analysis every day in the MLSC in Schofield? Did you know that I am there on Wednesdays at 2pm?