MAT337H1, Introduction to Real Analysis: Test 1 coverage

Term Test 1 will be based on the material covered in Jan 6 - Feb 1 classes. (See Sections 2.2-2.8 of the textbook). There will be proof questions and definition questions.

- Proof questions will be similar to ones from the recommended problems list.

- For definitions, you need to be able to define the following:

    - upper/lower bound of a subset $S \subset \mathbb{R}$, bounded above/below subset $S \subset \mathbb{R}$, least upper bound/greatest lower bound (sup/inf) of a subset $S \subset \mathbb{R}$ (Def. 2.3.1 in the textbook);
    - limit of a sequence of real numbers, convergent sequence (Def. 2.4.1);
    - monotone/strictly monotone sequence (second paragraph in Section 2.6);
    - subsequence (Def. 2.7.1);
    - Cauchy sequence (Def. 2.8.2).

    You do not need to cite exactly the definition stated in class. It is fine if you formulate it in your own words.

- Although you will not be asked to formulate or prove theorems discussed in class or in the textbook, these results might be useful for solving problems. This includes the following results:

    - the least upper bound principle (Thm. 2.3.3);
    - squeeze theorem (Thm. 2.4.6);
    - any convergent sequence is bounded (Prop. 2.5.1);
    - limit of the sum/difference/product/ratio theorem (Thm. 2.5.2);
    - monotone convergence theorem (Thm. 2.6.1);
    - nested intervals lemma (Thm. 2.6.3);
    - Bolzano-Weierstrass theorem (Thm. 2.7.2);
    - equivalence between being Cauchy and being convergent (Thm. 2.8.5).