

Read Apostol, Introduction, part 3, sections 3.1-3.9, pages 17-25. Optional: Also read sections 3.10-3.15 of the Introduction, pages 25-32.

1. From Apostol, I.3.3, page 19, do problems 2-5.
2. From Apostol, I.3.5, page 21, do problems 2,3.
3. From Apostol, I.3.12, page 28, do problems 1,7,8.
4. Prove that no rational number is a solution to $x^2 = 3$.
5. For each of the following sets of real numbers, determine whether there is an upper bound in \mathbb{R} . If possible, find the least upper bound (supremum) of the set.
 - (a) $S_1 = \{x \in \mathbb{R} \mid x^2 + 3x + 1 < 0\}$
 - (b) $S_2 = \{x \in \mathbb{Q} \mid x^2 + 3x + 1 < 0\}$
 - (c) $S_3 = \{x \in \mathbb{R} \mid x - x^3 < 0\}$

Note: You may find it helpful to graph these functions first.