Each homework is due Friday noon in the dropbox in the AP&M building.

Note: Please print your names and student ID numbers on your homework.
Please staple together your homework pages.

Note: No late homework will be accepted unless a written verification of
a valid excuse (such as hospitalization, family emergency, religious observance,
court appearance, etc.) is provided.

**Homework assignment 1, due Friday, 1/9.**

Pages 21–22.

#1’. If \( r \) is a rational (\( r \neq 0 \)) and \( x \) is irrational, prove that \( r - x \) and \( rx \)
are irrational.

#3. Prove Proposition(a),(c),(d) and list which axioms (A1)-(A5), (M1)-(M5), (D) you use for each part.

#4. and give an example of a set \( S \) and a subset \( E \) with \( \alpha = \beta \).

#8.

‘#99’. For page 2, Example 1.1, replace 2 by a real number \( r > 1 \). Let \( A \) be the set of positive rational numbers \( p \) with \( p^2 < r \). Prove that \( A \) has no
largest element.