

## Midterm 1 Info

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**Time & place:** Wednesday, September 21 at 6-7pm in MSEB 119.

**Topics:** Everything we covered in class in Chapters 1-3. (We have not covered the material on ordered fields in Chapter 1.)

**Format:** The midterm exam is closed book. There will be some proofs and some true/false questions.

**Be aware:**

- To get full credit you must write **complete**, **clear**, and **concise** solutions.
- Clearly label the important steps and techniques you use. To get full credit, you must write clear, complete, and concise solutions.
- Everything must be proven, except for the true/false problem. You may assume any results from class or from chapters 1-3 of the book unless explicitly stated otherwise, and you do *not* need to justify basic algebra moves or fundamental properties of the integers or real numbers.
- You can expect a proof involving sets, a proof by induction, and some logical manipulations (e.g., converse, contrapositive, negation of statements). There will be one question with true/false problems; for this question (and this question alone) you do not need to prove your claims.

**Review:** The homework problems and worksheet problems are *excellent* review problems. A few more good to review.

1. Prove the AGM inequality. (Proposition 1.4 of the text).
2. Prove that  $\sqrt{2}$  is irrational.
3. Prove that every  $n \in \mathbb{N}$  can be written as a product of primes.
4. Prove that  $(A \cup B)^c = A^c \cap B^c$  and  $(A \cap B)^c = A^c \cup B^c$ .
5. Prove that  $\sum_{i=1}^n i = \frac{n(n+1)}{2}$ .