

Math 255 - Spring 2018
Exam 1 Information

Exam 1 will be in class on Wednesday March 7. It will cover all of the material that we have covered so far this semester, up to and including the material we have covered from Section 4 of the textbook.

Please read these instructions carefully, as not heeding them will constitute a breach of the UVM Code of Academic Integrity:

- You may not use a calculator or any notes or book during the exam.
- You may not access your cell phone during the exam for any reason; if you think that you will want to check the time please wear a watch.
- The work you present must be your own.
- Finally, you will more generally be bound by the UVM Code of Academic Integrity, with which you should familiarize yourself if you haven't already.

You will be asked to acknowledge that you have read these instructions on the first page of the exam.

For each problem, you **must** write down all of your work carefully and legibly to receive full credit **and** use theorems and/or mathematical reasoning to support your answer, as appropriate.

Things that could be on Exam 1:

- Any reasonable proof by induction.
- Any proof or problem that is identical or substantially similar (same but with different numbers say) to a problem that was assigned on Homework 1, 2, 3, 4, 5, 6 or 7 in the problems suggested between January 22 and March 2, inclusively. All homework solutions are posted on our course website. **Solutions to other problems will not be posted**, although I will answer any question you have on Piazza or during my office hours.
- Any problems that is identical or substantially similar to any problem from the past two year's Exam 1, except problems 3 and 7 from 2017. These exams are posted on our website, and their solutions will be posted on Sunday afternoon. If I forget to do it at that time, please do not hesitate to email me to remind me.
- Given any theorem (even one we have not studied!), you may be asked to state the hypotheses and the conclusion of the theorem, and/or determine if the theorem can be applied to reach a certain conclusion.
- State and use any one of these important theorems/algorithms we have seen: the Well-Ordering (or least-integer) Principle, the Division Algorithm (Theorem 2 of Section 1), the Euclidean Algorithm (Theorem 3 of Section 1), Theorem 4 of Section 1, Theorem 1 of Section 3, the Unique Factorization Theorem (Theorem 2 of Section 2), the primality test given by Lemma 4 of Section 2, the Sieve of Eratosthenes, Theorems 1, 2 and 3 of Section 4, Lemma 1 of Section 4, computing the inverse of a unit modulo m .
- Give the definition of: divisibility, the greatest common divisor (either the book definition or the one given in class), relatively prime, prime number (either the book definition or the one given in class), unit, zero divisor, and congruence modulo n .
- You will definitely be asked to compute the inverse of a unit in $\mathbb{Z}/m\mathbb{Z}$ (similar to problem 6b) of Homework 7).

You will not be given any formulae for the exam.

Note about graduate credit: There will be an extra question for graduate credit. This will count as a required part of the exam for any student taking the course for graduate credit. For anyone not taking the course for graduate credit, the assigned grade will be the maximum of the grade including the question for graduate credit and the grade not including the question for graduate credit.