

The exam will have a total of twelve questions. You will be graded on your best ten, with the remaining two offering possible bonus points.

Five will be computational. You will need to prove your answers, and generally do your computations directly from the definition, but they will be computations. Drawn from the following list:

- Compute the supremum of a set
- Prove that some metric is actually a metric
- Prove a set is open
- Compute the limit of a sequence
- Compute the lim sup or lim inf of a sequence
- Compute the limit of Function
- Prove a function is uniformly Continuous
- Prove a sequence of functions converges pointwise
- Prove a sequence of functions converges uniformly

Four will be looking back at problems we've already done. I don't expect you to memorize these proofs word-for-word or anything, and in fact you shouldn't. I do want you to understand them well enough to reproduce them on the final. I will draw from these homework problems and in-class proofs:

- Hw1: 7, 9
- Hw2: 3, 8
- Hw3: 4, 8
- Hw4: 2, 5, 7
- Hw5: 1, 3
- Hw6: 1, 4, 5
- Hw7: 2, 3, 6

- Hw8: None
- Hw9: 5, 7, 8
- Hw10: 4
- Hw11: 5
- Lemma 1.24
- Proposition 2.8, Proposition 2.15, Proposition 2.24, Proposition 2.27
- Proposition 3.1 (1-3), Proposition 3.5, Proposition 3.21, Proposition 3.24, Proposition 3.30, Proposition 3.36, Proposition 3.45
- Lemma 4.5, Proposition 4.19, Proposition 4.22, Lemma 4.29,
- Proposition 5.11, Corollary 5.31, Corollary 5.32

Three problems will be new things you haven't seen before. I can't give a lot of specific guidance here, other than to say that I am *not* planning to focus on:

- The basic material about the field axioms. You can safely ignore pretty much all of sections 1.1 and 1.2, except for knowing the facts that we get out of them.
- Stuff on closures, interiors, and boundaries (Section 2.4), other than in the specific listed problems
- Stuff on connected sets (Section 4.4), other than in the specific listed problems
- There is a section 5.6 in the notes, but we didn't talk about it and you should ignore it completely.
- Nothing about sequences of functions (Section 6) except a possible computational problem.