

MATH 104, HOMEWORK #7

DUE THURSDAY, MARCH 10

Remember, consult the Homework Guidelines for general instructions. Results from class, our textbook, and graded homework are fair game to use unless otherwise specified. You may also use ungraded homework results from previous problem sets.

GRADED HOMEWORK:

- (a) Ross, Exercise 18.10.
(b) For which k with $0 < k < 2$ must there exist $x, y \in [0, 2]$ so that $|y - x| = k$ and $f(x) = f(y)$? Justify your answer.
- (a) Complete Ross, Exercise 19.4.
(b) What are the pros and cons of the three proofs that $f(x) = \frac{1}{x^2}$ is not uniformly continuous? (The three proofs being the one you just wrote, plus Example 3 and Example 6 in Section 19.)
- Complete Ross, Exercise 19.1. (Only a few of these will be carefully graded, but you won't know which ahead of time. Make sure each part is clearly labeled.) You can use any theorems through Section 19.

UNGRADED HOMEWORK:

Pay special attention to starred problems; they are usually classics we will use many times, often important theorems hidden in the exercises. Note I already listed the first two sections of ungraded HW on Piazza last week; they are here again in case you are using your homework sheets to keep track of them.

| Section | Exercises |
|---------|-----------------------------|
| 15 | 1, 2, 3, 4, 5, 6, 7 |
| 17 | 1, 2, 3, 5, 8, 9, 10, 11 |
| 18 | 1, 2, 3, 4, 5, 6, 7, 8, 11, |
| 19 | 2, 3, 5, 6, 8, 9 |