

# MATH 104, HOMEWORK #9

## DUE THURSDAY, APRIL 7

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:

1. (a) Determine the interval of convergence for the power series  $\sum_{n=0}^{\infty} \frac{x^{2n}}{5^n}$ .

(b) Let  $f_k(x) = \sum_{n=0}^k \frac{x^{2n}}{5^n}$  and let  $f(x) = \sum_{n=0}^{\infty} \frac{x^{2n}}{5^n}$ . Prove directly using the definition of uniform convergence that  $f_k \rightarrow f$  uniformly on the interval  $[0, 1]$ . (Note there is a theorem in Section 26 which gives us this for “free” later on, but now you are specifically working with the definition.)

2. Ross, Exercise 24.12.

3. Ross, Exercise 24.13.

### UNGRADED HOMEWORK:

Pay special attention to starred problems; they are usually classics we will use many times, often important theorems hidden in the exercises.

Section	Exercises
23	1, 2, 4, 5, 6, 8, 9
24	1, 2, 3, 4, 5, 10*, 11*, 15, 17