

Part I

No Part I this time.

Part II

No Part II this time.

Part III: Homework Problems (due Wednesday, April 24? at the beginning of class)

1. We've not paid much attention to it since most of our examples have been very well-behaved functions (we can take all the derivatives we want), but for a function to have a Taylor (or Maclaurin) series at a point, it must be differentiable at that point—this is in the definition of Taylor series. To have a Taylor (or Maclaurin) polynomial of degree n at a point, the function must be differentiable at least n times at that point.

For each of the following, create an example that satisfies the given criterion and explain why your example works. Make examples that are different from ones we've worked with in class already and different from your classmates' examples.

- (a) A function with a Maclaurin polynomial of degree 3.
- (b) A function that's defined for all real numbers but has no Maclaurin polynomial.
- (c) A function with a Taylor series at any real number a .