

Math 102 — Taylor's theorem

Problem 1. For each of the following, approximate the function value with the indicated Taylor polynomial and then give an estimate for the error of the approximation.

- a. Approximate $\sin(0.1)$ using the Maclaurin polynomial of degree 3
- b. Approximate $\sqrt{10}$ using the Taylor polynomial of degree 2 centered at $x = 9$

Problem 2. Find n so that the Maclaurin polynomial of degree n of $f(x) = e^x$ approximates e within 0.0001 of the actual value.

Problem 3. Find n so that the Maclaurin polynomial of degree n of $f(x) = \cos x$ approximates $\cos(\pi/3)$ within 0.0001 of the actual value.