

## 408L CLASS PROBLEMS

APRIL 29TH, 2020

*Problem 1.* Find the degree 3 Taylor polynomial of  $f(x) = \log(1 + x)$  about 0. Use your result to estimate  $\log(1.1)$ .

*Problem 2.* Suppose the degree 3 Taylor polynomial of a function  $f(x)$  is  $T_3(x) = 2 + 3x - x^2 + x^3$ . Find  $f''(0)$ .

*Problem 3.* Find the degree 2 Taylor polynomial of  $f(x) = \frac{1}{x^2+x+1}$ .

*Problem 4.* The degree three Taylor polynomial of  $f(x) = \sin(x)$  is  $T_3(x) = x - x^3/6$ . For which values of  $x$  does the remainder theorem imply  $|\sin(x) - T_3(x)| < .001$ ? (In other words, for which values of  $x$  does  $T_3(x)$  calculate  $\sin(x)$  to two decimal places.)