MAT 125-FINAL EXAM-FALL 2015

NAME:

TA NAME:

∗Each numbered question is worth 20% of the exam.

1. Find the absolute minimum of $f(x) = xe^{-x}$ on the interval $[-1, 1]$.

2) A rectangle has its base on the x axis and its upper two vertices on the the parabola $y = 12 - x^2$. What is the largest area the rectangle can have?

3) Determine the following limits or explain why they do not exist if $f(x) = \frac{\tan x}{x}$

$a) \lim_{x \to 0} f(x)$

$b) \lim_{x \to -\infty} f(x)$

$c) \lim_{x \to \frac{\pi}{2}^+} e^{f(x)}$

4) Graph the following on a scaled set of axes. Label all critical points and inflection points. (Exact values of any x intercepts NOT required.)

$$f(x) = x^4 - 4x^3 + 10$$

5) Graph the following on a scaled set of axes. Label all critical points and any asymptotes. (Inflection points are not required.)

$$y = \frac{(x+1)^2}{1+x^2}$$