MATH 158 Review Assignment, Spring 2013

Michael Monagan

These 10 problems are intended as warm up exercises for the final exam. You've probably forgotten how to do certain calculations and you need some practice. You can also use this as a practice final. The questions will give you practice with various types of antiderivatives and definite integrals.

If you failed or did't do two or more assignments, for whatever reason, you may use this as a make up assigment. If you want to do this, you should hand it in on Tuesday April 16th by 6pm (one hour before the final exam). I will mark it (4 marks for completion, 8 marks for selected questions) and if the mark you get is better than your worst assigment mark, I'll use this mark instead.

Chapter 8 Integration

Section 8.1 exercises 75 and 84.
For exercise 84 I get the minimum acceleration is $\frac{576}{5} \, m/s^2$.

Section 8.5 exercise 81 and review exercise 86 on page 528.

9.1 Integration by Parts and 13.2 Standard Deviation

The P.D.F. for the exponential distribution is $f(x) = ke^{-kx}$ for $0 \leq x < \infty$ where the parameter $k > 0$. Show that average is $1/k$ and the variance is $1/k^2$. To do this you need to calculate antiderivatives for $\int kxe^{-kx}\, dx$ and $\int kx^2e^{-kx}\, dx$. Use integration by parts.

9.1 Integration by Parts and 10.8 Applications of Double Integrals

Section 10.8 exercise 22. Please draw the region R. You should get $9\ln 3 - 4$.

9.4 Simpson's Rule

If z is a random variable from the standard normal distribution,

$$Pr(0 < z < 1) = \int_0^1 \frac{e^{-x^2/2}}{\sqrt{2\pi}} dx = 0.341344746.$$

Approximate the definite integral using a calculator and Simpson's rule with $n = 2$ and $n = 4$ intervals. For each approximation, how many correct digits do you get?

11.3 Applications of Differential Equations

Do 11.3 exercise 3 Newton's Law of Cooling and review exercise 26 Continuous Compound Interest on page 707. Use the method of separation of variables to find the general solution to the DEs.