Homework 13

Math 147, Fall 2017

This homework is due on TUESDAY, Nov. 28.

1. Read Sections 5.6, 5.8, and 6.1. After reading these sections, you should be able to answer the following questions (which are *not* to be turned in).

   - What is an *initial-value problem*?
   - Is $2\sin x$ an antiderivative of $\sin^2 x$?
   - Is $\cos x + \ln 5$ an antiderivative of $-\sin x$?
   - If $f(x)$ is an even function ($f(-c) = f(c)$ for all real numbers c), does this imply that $\int_{-2}^{2} f(x)dx = 0$?
   - What is an example of a function $f(x)$ for which $\int_{2}^{-5} f(x)dx$ is positive?

2. For the following recursions, determine all fixed points, whether they are stable, and, if so, whether they are approached with or without oscillations:

   (a)
   $$a_{n+1} = |a_n|$$

   (b)
   $$a_{n+1} = \begin{cases} -0.2a_n & \text{if } a_n \leq 0 \\ \sqrt{a_n} & \text{if } a_n > 0 \end{cases}$$

3. Graph the function $f(x) = 1 - |x|$, and compute the definite integral $\int_{-2}^{0.5} f(x)dx$.

4. Section 5.6 # 12, 16, 18, 24

5. Section 5.8 # 10, 24, 26, 70

6. Section 6.1 # 36, 62, 68

7. (These problems are *not* to be turned in!)

8. (*Extra credit: 2 pts.) *Do the practice exam, and staple your solutions to your homework.*

9. (These problems are *not* to be turned in!)

   (a) Section 5.6 # 13, 20

   (b) Section 5.8 # 5, 9, 31, 35, 67

   (c) Section 6.1 # 1, 3, 5, 15, 21, 23

   (d) Given an example of a sequence whose limit must be computed using Sandwich Theorem.