Math 133A, Term Test II:
Study Guide

1. The second term test of the semester will take place in class time on 
   **Wednesday, April 13** (12:00-1:15 p.m. in Sci 142). Please arrive on 
time!

2. The test will cover the material **since the last term test** (i.e. it is not cumulative). 
   Specifically, you will be tested on material from 
   Weeks 5 through 10. This includes second-order equations, harmonic 
   motion, resonance, and a quick introduction to linear algebra (which 
   we will begin covering this coming week).

3. You will be permitted a **one-page cheat sheet** but **no calculators**. 
   You may put whatever you want on the cheat sheet and write on 
   the front and back if you like. Again, I would recommend you treat 
   creating the study sheet as a study exercise. It is an opportunity to go 
   through the notes and summarize the most important points, or the 
   material with which you have struggled the most.

4. Study materials have been posted on the course website and also on 
   WebAssign. There are far more questions than can be reasonably 
   expected to be completed prior to the test; however, the questions are 
   representative of what you should expect to find on the test.

5. **The test will contain questions on resonance**! Please do not 
   neglect to study these problems, and in particular the homework ques-
   tions on resonance for damped mechanisms.

6. The test will include exactly **one of three proofs** from the online 
   notes:
      
      (a) The proof that, if $y_1$ and $y_2$ are solutions of $y'' + p(x)y' + q(x)y = 0$ 
          then $y = C_1y_1 + C_2y_2$ is a solution. (Week 5 notes)
      
      (b) The proof that, if $ar^2 + br + c = 0$ has a repeated root $r$, then the 
          corresponding solution of $ay'' + by' + cy = 0$ is $y(x) = C_1e^{rx} + 
          C_2xe^{rx}$. (Week 6 notes)
      
      (c) The proof that $y = y_c + y_p$ is the general solution of $y'' + p(x)y' + 
          q(x)y = g(x)$, where $y_c$ solves $y''_c + p(x)y'_c + q(x)y_c = 0$ and $y_p$ 
          solves $y''_p + p(x)y'_p + q(x)y_p = g(x)$. (Week 7 notes)