Math 33b **Midterm 2**
Lecture 2
Fall 2007

Name: _____

Section: _____

Instructions:

- **There are 3 problems. Problems 1 and 2 each have two parts. Make sure that you are not missing any pages.**
- **Show all work in detail or your answer will not receive credit.**
- **Write neatly and box all answers.**
- **No calculators, PDA's, cell-phones, books, or notes are allowed.**
- **Answer the questions in the spaces provided on the question sheets. If you run out of room for an answer, continue on the back of the page.**
- **Do not use your own scratch paper. Extra scratch paper is available from the front of the room.**
- **If you have extra time, you might want to check your answers.**

Question	Points	Score
1	40	
2	40	
3	40	
Total:	120	

1. (a) (20 points) Find the general solution for

$$2y'' = -8y$$

(b) (20 points) Suppose y is a solution for the initial value problem

$$2y'' = -8y, \quad y(0) = -2, \quad y'(0) = -4\sqrt{3}$$

Find t with $-\pi \leq t < \pi$ so that $y(t) = 4$

Hint: One way to find t is by examining the graph of y.
Hint: $\cos(a + b) = \cos(a)\cos(b) - \sin(a)\sin(b)$.

2. (a) (20 points) Find the general solution for:

$$y'' - 2y' + y = 0$$

(b) (20 points) Find the general solution for:

$$y'' - 2y' + y = e^t$$

3. (40 points) Without using the shortcut formula from the book, find a solution for:

$$ty'' - (1+t)y' + y = t^2 e^{2t}$$

Hint: $1+t$ and e^t are each solutions for $ty'' - (1+t)y' + y = 0$
Hint: $\int te^t \, dt = te^t - e^t$

Extra Scratch Paper:

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