

Math 242, Exam 2, Spring 2013

Write everything on the blank paper provided. **You should KEEP this piece of paper.** If possible: turn the problems in order (use as much paper as necessary), use only one side of each piece of paper, and leave 1 square inch in the upper left hand corner for the staple. If you forget some of these requests, don't worry about it – I will still grade your exam.

The exam is worth 50 points. **SHOW** your work. *CIRCLE* your answer. **CHECK** your answer whenever possible.

No Calculators or Cell phones.

The solutions will be posted later today.

1. (10 points) Find the general solution of $y''' + 3y'' + 3y' + y = 0$. Check your answer.
2. (10 points) Find the general solution of $y'' - 4y' + 29y = 0$. Check your answer.
3. (10 points) Solve the initial value problem $y'' - y = 0$, $y(0) = 4$, and $y'(0) = 2$. Check your answer.
4. (10 points) Solve $\frac{dy}{dx} = y^2 + y - 6$, $y(0) = y_0$. Sketch your solution when $0 \leq x$ for various values of y_0 . Check your answer.
5. (10 points) The acceleration of a car is proportional to the difference between 250 ft/sec and the velocity of the car. If this car can accelerate from 0 to 100 ft/sec in 10 seconds, how long will it take for the car to accelerate from rest to 150 ft/sec?