Math 211: Ordinary Differential Equations
Instructor: Qiongling Li
Midterm 1
Summer 2012

Please print name:

When you are finished with the exam, please sign the honor code below.
On my honor, I have neither given nor received any unauthorized aid on this
exam:

This exam is intended to be taken in 1 hour. No books, notes or any other
form of aid is permitted. There are 100 possible points. You must show all of
your work, justifying when necessary. Partial credit will be given.

#1	
#2	
#3	
#4	
#5	
TOTAL	

(#1: 20 points) Find solution of the initial value problem
$(1 + t)x\prime + x = cost, x(-\frac{\pi}{2}) = 0.$

(#2: 20 points)Find solution of differential equation $ydx + (x^2y - x)dy = 0$.
(Hint: You may use integrating factor.)

(#3: 20 points) Draw direction field of $y\prime = ty^2$ and skecth the integral curve of this direction field.

(#4: 20 points) Find general solution of $(3x + y)dx + xdy = 0$.
(Hint: this is a homogeneous equation.)

(#5: 20 points)Suppose that y is a solution to the initial value problem $y' = (y - 3)e^{cos(x+y)}$ and $y(1) = 1$. Show that $y(t) < 3$ for all t which x is defined.