Math. 308–200. Spring 2016. Instructor P. Kuchment
Home assignment #5 (18 points, 3 p/problem). Due March 24th.
Attach your solution pages to this original list of problems.
Write in a clear and organized manner and
use letters of a size sufficient for reading by anyone.
Show all work!!! Justify your answers. Good luck!!!

For the instructor's/grader's use only

1	2	3	4	5	6	7	8

Student's name _____

1. a) Find the Wronskian of the functions $\sin x$ and x^2.
   b) are the functions linearly dependent?

2. Write the characteristic equation and find its roots for the homogeneous linear constant coefficient ODE
$$y'' = 2y' - y$$

3. Write the characteristic equation and find its roots for the homogeneous linear constant coefficient ODE
$$5y'' + y' = 0$$

4. Write the characteristic equation and find its roots for the homogeneous linear constant coefficient ODE
$$y'' + y' + y = 0$$

5. Find the general solution of the ODE
$$\frac{d^2y}{dt^2} + \frac{dy}{dt} - y = 0$$

6. Find the solution of the IVP
$$y''(x) - 4y(x) = 0, y(0) = 1, y'(0) = 2$$

Extra Credit. 3 points per a problem. No partial credit

7. The Wronskian of two functions $y_1(t)$ and $y_2(t)$ is equal to $\cos t$. Can these functions be solutions of the same equation $ay'' + by' + cy = 0$ with constant coefficients a, b, c? Explain your answer.

8. Find an example of two functions $y_1(t)$ and $y_2(t)$, whose Wronskian is equal to t^2.