

**MATH 2260 (Ordinary Differential Equations I) — Fall 2014**  
**Homework #5**

**Due Date:** Tuesday, October 28, in class or in marking box #59 by 5:00 PM. You must show all work to receive credit.

1. (5 points each) From Section 5.2:
  - (a) #1
  - (b) #5
  - (c) #7
  - (d) #11
2. (10 points each) From Section 5.2:
  - (a) #13
  - (b) #15
  - (c) #17
3. (10 points) Find the solution of  $16y'' + y = 0$ ,  $y(0) = 2$ ,  $y'(0) = 9$ .
4. (10 points) Find the solution of  $15y'' - 2y' - y = 0$ ,  $y(0) = 1$ ,  $y'(0) = 1$ .
5. (10 points each) From Section 5.6:
  - (a) #25
  - (b) #29
6. (20 points) Find a solution of the form  $y(x) = x^\alpha$  (for real-valued  $\alpha$ ) to the ODE  $x^2y'' - xy' + y = 0$  for  $x > 0$ . Use this solution with reduction of order to find the general solution of the ODE. You must prove that the two solutions you find are linearly independent and explicitly verify that they satisfy the ODE to receive full credit.