

Linear Analysis II Set 7

1. Find one solution to $xy'' + y' + xy = 0$.
2. Write the first three nonzero terms in the two series solutions for these differential equations:
 - a. $x^2y'' + x(x - 3)y' - y = 0$.
 - b. $3x^2y + x(1 + 3x^2)y' - 2xy = 0$.
 - c. $3x^2y + x(7 + 3x)y + (1 + 6x)y = 0$.
3. Find two linearly independent solutions to $x^2y' + x(3 - 2x)y + (1 - 2x)y = 0$. One of the solutions could be left in terms of an integral.