Problems 38 and 39 on page 209.

Find the power series solution of each of the following. Give the interval of convergence of each.

1. $y'' + xy' + y = 0, \quad y(0) = 1, \; y'(0) = 0.$

2. $y'' + xy' + y = 0, \quad y(0) = 0, \; y'(0) = 1.$

3. $(1 - x)y'' + y = 0, \quad y(0) = 0, y'(0) = 1,$

4. $(1 - x)y'' + y = 0, \quad y(0) = 1, y'(0) = 0,$

5. $y'' + xy' + 2y = 0.$

6. $(1 + x^2)y'' - 4xy' + 6y = 0.$