Math 225 – Quiz #15: Series Solutions

Clearly and neatly show all work for each problem. Solutions with no work will receive no credit.

1. Find two power series solutions, y_1 and y_2, of the given differential equations about the ordinary point $x = 0$. For series solutions that do not terminate, give the first 4 non-zero terms in the series.

$(a) \quad (x-1)y'' + y' = 0$ $\qquad\qquad$ $(b) \quad (x-1)y'' - xy' + y = 0$

2. Use the method of Frobenius to obtain at least one series solution about the singular point $x = 0$. Give the first four non-zero terms in the series. Then find a second solution. If you cannot find a second series solution, you may leave that second solution as an integral.

$(a) \quad 9x^2y'' + 9x^2y' + 2y = 0$ $\qquad\qquad$ $(b) \quad xy'' - xy' + y = 0$