

Name:

Perm number:

Test 1

Time: 50 minutes

1. Find all solutions to $y'' - \frac{2}{3}y' - \frac{1}{3}y = \frac{1}{3}x^2$.

2. Find all solutions to $y'' - \frac{2}{3}y' - \frac{1}{3}y = \frac{1}{3}x^2$ for which $y(0) = -6$ and $y'(0) = 8$.

3. Find all **real** solutions to $y'' + 4y' + 13$ for which $y(0) = 1$ and $y'(0) = 1$.

4. Show how to derive a power series solution to $y'' + 2y = 0$ for which $y(0) = 1$ and $y'(0) = 0$. List terms up to x^4 .