

Ma 2a P: Homework N.4

due Tuesday Nov 2, 12 noon

1. Solve the following differential equations:

- $y'' - 2y' + y = e^t/(1 + t^2)$
- $y'' - y' - 2y = 2e^{-t}$
- $y^{(5)} - 3y^{(4)} + 3y^{(3)} - 3y'' + 2y' = 0$
- $y^{(4)} + 2y'' + y = \sin(t)$, with $y(0) = 2$, $y'(0) = 0$, $y''(0) = -1$,
 $y^{(3)}(0) = 1$.

2. Problem 20, §4.1 (Abel's theorem)

3. Problem 21, §5.2 (The Hermite equation)

4. Solve the following equations by power series method (expansion around the point x_0)

- $(1 + x^2)y'' - 4xy' + 6y = 0$, around $x_0 = 0$
- $xy'' + y' + xy = 0$, around $x_0 = 1$.