

MATH 262 FINAL EXAM

1) Solve

i) $y'' - 2y' + 4y = 3e^{-2t}$ Give the asymptotics.

ii) $t^2y'' - 2y = \sin(t)$, for $t > 0$, verify $y_1(t) = t^2$, and $y_2(t) = 1/t$ solve the homogeneous equation and find an expression in integrals for the particular solution. Go through the entire method.

iii) $y'' + xy = 0$, $y(0) = 1$, $y'(0) = 0$ by series about zero. Get the radius of convergence of your solution.

2) Solve the pde:

$$\frac{\partial u}{\partial x} = -\frac{\partial u}{\partial t}$$

Get the general solution.