M 327J - Differential Equations with Linear Algebra

September 12, 2022

Quiz 2

1. **[4 points]** Find the particular solution to the initial value problem

$$\begin{cases} \dfrac{d^2y}{dt^2} - 2\dfrac{dy}{dt} + y = e^{t-2} \\ y(2) = 1 \\ y'(2) = 0 \end{cases}$$

2. **[3 points]** Find the general solution to

$$\frac{d^2y}{dt^2} + 4y = 0.$$

3. **[3 points]** The functions

$$\begin{aligned} \psi_1(t) &= \sin(2t) + te^t \\ \psi_2(t) &= \cos(2t) + 8\sin(2t) + te^t \\ \psi_3(t) &= te^t - \cos(2t) \end{aligned}$$

are all solutions to some second order nonhomogeneous linear equation. Find the general solution to this equation.