

MA2327, Homework #4
due Thursday, Dec. 1 or Dec. 8

1. Use Theorem 2.16 to prove Theorem 2.17 and then use Theorem 2.17 to solve

$$y''(t) - 2y'(t) + y(t) = e^t \log t, \quad t > 0.$$

2. Solve the inhomogeneous equation $y'''(t) - y''(t) + 3y'(t) + 5y(t) = t^2 - t + e^{2t}$.

3. Solve the inhomogeneous equation $y''(t) - 3y'(t) + 2y(t) = 2 \cos t - 3t + 4e^{2t}$.

4. The function $y_1(t) = t$ is easily seen to satisfy the linear equation

$$t^3 y''(t) - t y'(t) + y(t) = 0, \quad t > 0.$$

Use reduction of order to find a basis of solutions for this equation.