MATH-SHU 362

Recitation 3: Second Order ODE

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Exercise 1. *Find the general solution of the given differential equation:*

- $y'' + 2y' - 3y = 0$;
- $4y'' - 25y = 0$.

Exercise 2. *Find the solution of the initial value problem*

$$y'' + y = 0, y(\pi/3) = 2, y'(\pi/3) = -4.$$

Describe its behavior for increasing t.

Exercise 3. *Determine the values of α, if any, for which all solutions of*

$$y'' - (2\alpha - 1)y' + \alpha(\alpha - 1)y = 0,$$

tend to zero as $t \to \infty$; also determine the values of α, if any, for which all (nonzero) solutions become unbounded as $t \to \infty$.

Exercise 4. *Without solving, determine the Wronskian of two solutions to the following differential equation*

$$t^4 y'' - 2t^3 y' - t^4 y = 0.$$