

Homework #3

You must justify all steps to get credit for your work

Please submit the HW via CASA or email your completed assignment as a single PDF file to jshi24@CougarNet.UH.EDU.

(1)[4Pts] Find the general solution of the following differential equation

$$y'' - 6y' + 9y = 0$$

(2)[4Pts] Find the general solution of the following differential equation

$$y'' - 4y' + 5y = 0$$

(3)[4Pts] Find the general solution of the following differential equation

$$y'' + y' + \frac{1}{4}y = 0$$

(4)[4Pts] Find the general solution of the homogeneous differential equation and solve the following IVP

$$y'' + 10y = 0, \quad y(0) = 5, y'(0) = 5/\sqrt{10}$$

(5)[4Pts] Consider the following linear second order differential equation

$$y'' + \frac{1}{x}y' - \frac{1}{x^2}y = 0, \quad x > 0$$

- (a) Show that there are 2 solutions of the form x^r .
- (b) Prove that the 2 solutions are linearly independent.
- (c) Find the solution satisfying the initial condition $y(1) = 0, Y'(1) = 1$