Question: 1. Solve the differential equations

          (a) $y'' - 4y' - 5y = 0$

[5+5+5]   **(b)** $y'' - 10y' + 25y = 0$

          (c) $y'' - 2y' + 2y = 0$

Question: 2 Determine whether the functions

[5] $f_1(x) = \cos 2x, \ f_2(x) = 1, \ f_3(x) = \cos^2 x \quad -\infty < x < \infty$

          are linearly independent or linearly dependent.

Question:3. The function $y_1 = x^4$ is a solution of the differential equation

[10] $x^2 y'' - 7xy' + 16y = 0$. Use the formula to find the second solution
         and hence find the general solution.

Question:4. Solve of the differential equation by using Variation of Parameter

[10] $x^2 y'' - 2xy' + 2y = x^4 e^x$

Question:5. Use power series method to find the general solution of the

[10]   differential equation $(x^2 + 1) y'' + 2xy' = 0$.