Assignment-3

1. Find the general solution of the equation \( \frac{d^3y}{dx^3} + 6 \frac{d^2y}{dx^2} + 11 \frac{dy}{dx} + 6y = 0 \).
2. Solve \( \frac{d^3y}{dx^3} + 8 \frac{d^2y}{dx^2} + 16y = 0 \).
3. Solve \( \frac{d^4y}{dx^4} - 3 \frac{dy}{dx} + 2y = e^{3x} \) by the method of undetermined coefficients.
4. Use method of undetermined coefficients to find the general solution of the equation

\[
\frac{d^2y}{dx^2} + 2 \frac{dy}{dx} + 4y = 111 e^{2x} \cos 3x.
\]
5. Solve \( x^2 \frac{d^2y}{dx^2} + 5xy = 0 \).
6. Find the general solution of \( 3x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 2y = 3 \).
7. Solve the equation to find the general solution of the equation \( (1 + x)^2 \frac{d^2y}{dx^2} + (1 + x) \frac{dy}{dx} + y = 4 \cos(\ln(1 + x)) \).
8. Find the general solution of the second order equation \( \frac{d^2y}{dx^2} + y = \frac{1}{(1 + \sin x)} \), by the method of variation of parameters.
9. Find the general solution of the second order equation \( \frac{d^2y}{dx^2} - 2 \frac{dy}{dx} + y = x e^x \ln x \), by the method of variation of parameters.
10. Find the general solution of the second order equation \( xy'' - (2x + 1)y' + (x + 1)y = x^2 \), knowing that \( e^x \) is one solution of the homogeneous equation.