16. Solve the second order differential equation

\[
\frac{d^2 y}{dx^2} + 2 \frac{dy}{dx} + 10y = 3e^{2x}
\]

given that when \( x = 0, \ y = 1 \) and \( \frac{dy}{dx} = 0. \)

Answer

*Particular Solution is:* \( y = \frac{5}{6} e^{-x} \cos 3x + \frac{1}{6} e^{-x} \sin 3x + \frac{1}{6} e^{2x} \)