Worksheet: Method of Variation of Parameters

Q1: Find the general solution for the ordinary differential equation $y'' + y = \sin^2(x)$ using the method of variation parameters.

A $y = c_1 \cos(x) + c_2 \sin(x) + \frac{1}{6}\cos(2x)$

B $y = c_1 \cos(x) + c_2 \sin(x) + 6\cos(2x) + \frac{1}{2}$

C $y = c_1 \cos(x) + c_2 \sin(x) + \frac{1}{6}\cos(2x) + \frac{1}{2}$

D $y = c_1 \cos(x) + c_2 \sin(x) + \frac{1}{6}\cos(2x) + 2$

Q2: Find the general solution for the following differential equation using the method of variation of parameters: $y'' - 3y' + 2y = \cos(e^{-x})$.

A $y = c_1 e^{-x} + c_2 e^{2x} - e^{2x}\cos(e^{-x})$

B $y = c_1 e^{x} + c_2 e^{2x} - e^{-2x}\cos(e^{-x})$

C $y = c_1 e^{x} + c_2 e^{2x} - e^{2x}\cos(e^{-x})$

D $y = c_1 e^{x} + c_2 e^{-2x} - e^{2x}\cos(e^{-x})$