Excercise Problems : find the general sol

(1) $y'' - 4y = x \sinh x$ (2) $(D-2)^2 y = 8(e^{2x} + \sin 2x + x^2)$

(3) $(D^4 + 2D^2 + 1)y = x^2 \cos x$ (4) $y'' - 2y' + y = xe^x \sin x$.

↓ $m = \pm i, \pm i$

— × —

Using the method of undetermined coefficients, solve the following problems

(1) $y'' + 2y' + 4y = 2x^2 + 3e^{-x}$ (2) $\frac{d^2y}{dx^2} + y = \sin x$

(3) $y'' - y = e^{3x} \cos 2x - e^{2x} \sin 3x$

— × —

Use the method of Variation of parameters to solve the following problems

(1) $y'' + y = \csc x$ (cosec x) (2) $y'' + y = \frac{1}{1+\sin x}$ (3) $y'' - 2y' = e^x \sin x$

(4) $y'' - 2y' + 3y = x^3 + \cos x$

— × —

Problems on Euler-Cauchy & Legendre equations

(1) $x^2y'' - xy' + y = \log x$ (2) $x^2y'' - 3xy' + y = \log x \cdot \frac{\sin(\log x) + 1}{x}$

(3) $x^2y'' + 4xy' + 2y = e^x$ (4) $(1+x)^2 y'' + (1+x)y' + y = 2\sin(\log(1+x))$.

(5) $(2x+3)^2 y'' - (2x+3)y' - 12y = 6x$.

— × —