

Problems to find Complementary function  $y = y_c$ :

1. Solve  $(4D^4 - 8D^3 - 7D^2 + 11D + 6)y = 0$  /\*2./,/\*5./,/\*8./
2. Solve  $4\frac{d^4y}{dx^4} - 4\frac{d^3y}{dx^3} - 23\frac{d^2y}{dx^2} + 12\frac{dy}{dx} + 36y = 0$  /\*5./
3. Solve  $\frac{d^4y}{dx^4} + m^4y = 0$  /\*6./
4. Solve  $\frac{d^4y}{dx^4} + 5\frac{d^3y}{dx^3} + 6\frac{d^2y}{dx^2} - 4\frac{dy}{dx} - 8y = 0$  /\*8./

Problems to find General solution  $y = y_c + y_p$  by Inverse differential operator method:

1. Solve  $\frac{d^2y}{dx^2} - 4y = \cosh(2x - 1) + 2^x$  /\*1./,/\*4./
2. Solve  $(D^2 - 2D + 5)y = e^{2x} \sin x$  /\*1./,/\*4./
3. Solve  $\frac{d^2y}{dx^2} + 16y = x \sin 3x$  /\*1./
4. Solve  $\frac{d^3y}{dx^3} + 6\frac{d^2y}{dx^2} + 11\frac{dy}{dx} + 6y = e^x + 1$  /\*1./,/\*4./,/\*5./
5. Solve  $\frac{d^2y}{dx^2} - 4y = \cosh(2x - 1) + 3^x$  /\*2./
6. Solve  $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 1 + 3x + x^2$  /\*2./,/\*8./
7. Solve  $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x \cos x$  /\*2./
8. Solve  $(D - 2)^2y = 8(e^{2x} + x + x^2)$  /\*3./
9. Solve  $(D^2 - 4D + 3)y = e^x \cos 2x$  /\*3./
10. Solve  $(D^2 - 1)y = x \sin 3x$  /\*3./
11. Solve  $(D^3 - 6D^2 + 11D - 6)y = e^{2x}$  /\*3./
12. Solve  $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6x = 0$ ; Given that  $y(0) = 0$  and  $\frac{dy}{dx}(0) = 15$ . /\*4./
13. Solve  $(D^2 + 4)y = x^2 + e^{-x}$  /\*5./
14. Solve  $y'' + 4y' - 12y = e^{2x} - 3 \sin 2x$  /\*6./
15. Solve  $(D^2 + 7D + 12)y = \cosh x$  /\*6./
16. Solve  $y'' + 4y' + 4y = 8x^2$ ; Given that  $y(0) = 1$  and  $y'(0) = 2$  /\*7./
17. Solve  $y'' + 4y = x^2 + \cos 2x + 2^{-x}$  /\*7./
18. Solve  $y'' - 2y' + y = xe^x + x$  /\*7./
19. Solve  $(D^3 + D^2 - 4D - 4)y = 3e^{-x} - 4x - 6$  /\*7./
20. Solve  $\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} + \frac{dy}{dx} = e^{-x} + \sin 2x$  /\*8./

Problems to find General solution  $y$  by method of undetermined coefficients:

1. Solve  $y'' - y' - 2y = x + \sin x$  /\*1./,/\*4./
2. Solve  $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = x^2 + e^x$  /\*2./
3. Solve  $(D^2 + 2D + 4)y = 2x^2 + 3e^{-x}$  /\*3./,/\*8./
4. Solve  $(D^2 - 2D)y = e^x \sin x$  /\*5./
5. Solve  $\frac{d^2y}{dx^2} + y = 2 \cos x$  /\*6./
6. Solve  $y'' - 5y' + 6y = 2e^x + 4 \cos 2x$  /\*7./

Problems to find General solution  $y$  by method of variation of parameters:

1. Solve  $D^2y + y = \tan x$  /\*1./,/\*4./
2. Solve  $\frac{d^2y}{dx^2} - y = \frac{2}{1 + e^x}$  /\*2./
3. Solve  $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$  /\*3./
4. Solve  $(D^2 - 2D + 2)y = e^x \tan x$  /\*5./
5. Solve  $y'' + 4y = \tan 2x$ . /\*6./
6. Solve  $y'' + y = x \sin x$  /\*6./
7. Solve  $y'' - 2y' + y = \frac{e^x}{x}$  /\*7./
8. Solve  $y'' + a^2y = \sec ax$  /\*8./

REFERENCE:

/\*1./-MQP(15MAT21); /\*2./-JUN 16(15MAT21); /\*3./-DEC 16(15MAT21);

/\*4./-MQP(14MAT21); /\*5./-JUN 15(14MAT21); /\*6./-DEC 15(14MAT21);

/\*7./-JUN 16(14MAT21); /\*8./-DEC 16(14MAT21);