

110-1 ENGINEERING MATHEMATICS PRACTICE

(考前練習題)(有附課本頁碼及題號)

Solve the given differential equation by separation of variables.(2-2)

1. $\frac{dy}{dx} = (x + 1)^2$ (p48.2)

2. $dy - (y - 1)^2 dx = 0$ (p48.4)

3. $\frac{dy}{dx} + 2xy^2 = 0$ (p48.6)

Find the general solution of the given differential equation.(2-3)

4. $\frac{dy}{dx} + 2y = 0$ (p57.2)

5. $3\frac{dy}{dx} + 12y = 4$ (p57.4)

6. $y' + 2xy = x^3$ (p57.6)

Determine whether the given differential equation is exact. If it is exact, solve it.(2-4)

7. $(2x + y)dx - (x + 6y)dy = 0$ (p64.2)

8. $(5x + 4y)dx + (4x - 8y^3)dy = 0$ (p64.3)

9. $(2xy^2 - 3)dx + (2x^2y + 4)dy = 0$ (p64.5)

D.E. Solve by substitution(2-5)

10. $(x + y)dx + xdy = 0$ (p68.2)

11. $ydx = 2(x + y)dy$ (p68.4)

12. $(y^2 + yx)dx + x^2dy = 0$ (p68.6)

Find a second solution $y_2(x)$ (3-2)

13. $y'' + 2y' + y = 0, y_1 = xe^{-x}$ (p119.2)

14. $y'' + 9y = 0$, $y_1 = \sin 3x$ (p119.4)

15. $y'' - 25y = 0$, $y_1 = e^{5x}$ (p119.6)

Find the general solution (3-3,3-4,3-5)

16. $\frac{d^3x}{dt^3} - \frac{d^2x}{dt^2} - 4x = 0$ (p125.20)

17. $y''' - 6y'' + 12y' - 8y = 0$ (p125.22)

18. $y^{(4)} - 2y'' + y = 0$ (p125.24)

19. $y'' - 8y' + 20y = 100x^2 - 26xe^x$ (p135.6)

20. $4y'' - 4y' - 3y = \cos 2x$ (p135.8)

21. $y'' + 2y' = 2x + 5 - e^{-2x}$ (p135.10)

22. $y'' + y = \sec \theta \tan \theta$ (p140.4)

23. $y'' + y = \sec^2 x$ (p140.6)

24. $y'' - y = \cosh x$ (p140.7)

Find a homogeneous Cauchy–Euler differential equation whose general solution is given.(3-6)

25. $y = c_1x^4 + c_2x^{-2}$ (p146.33)