

Tutorial: 06

Subject Code: 3110015

Year: 2018 - 2019

Higher Order Equations

Solve the following initial value problem.

1. $y'' + 9y = 0, \quad y(0) = 4; \quad y'(0) = -6.$
2. $y'' + 3y' + y = 0, \quad y(0) = 1; \quad y'(0) = 0.$

Find a general solution of following equations.

3. $4y'' + 4y' - 3y = 0$
5. $9y'' + 30y' + 25y = 0$
4. $y'' + 9y' + 20y = 0$

Solve the following initial value problem.

6. $y'' + y' - 6y = 0, \quad y(0) = 10; \quad y'(0) = 0.$
7. $8y'' - 2y' - y = 0, \quad y(0) = -0.3; \quad y'(0) = -0.325.$
8. $y'' + 2.2y' + 1.17y = 0, \quad y(0) = 2; \quad y'(0) = -2.6.$

Find a general solution of following equations.

9. $25y'' + 40y' + 16y = 0$
11. $y'' - 9\pi^2 y = 0$
10. $16y'' - 8y' + 5y = 0$

Solve the following initial value problem.

12. $9y'' + 6y' + y = 0, \quad y(0) = 4; \quad y'(0) = -\frac{13}{3}.$
13. $y'' - 25y = 0, \quad y(0) = 0; \quad y'(0) = 20.$

Solve the following boundary value problem.

14. $y'' + 4y = 0, \quad y(0) = 3; \quad y(\pi/2) = -3.$

15. $y'' + 2y' + 2y = 0, \quad y(0) = 1; \quad y(\pi/2) = 0.$

16. $3y'' - 8y' - 3y = 0, \quad y(-3) = 1; \quad y(3) = \frac{1}{e^2}.$

Find a general solution of following equations.

17. $y'' - 2y' + 2y = 0$

19. $4y'' + 4y' + 10y = 0$

18. $y'' + 4\pi^2 y = 0$

Solve the following differential equations.

20. $y^{(4)} - 16y = 0$

22. $(D^3 - D^2 - D + 1)y = 0$

21. $y^{(4)} - 2y'' + y = 0$

23. $(16D^4 - 40D^2 + 9)y = 0$

Solve the following initial value problem.

24. $y^{(4)} = 0, \quad y(0) = 1; \quad y'(0) = 16; \quad y''(0) = -4.$

25. $y''' - 3y'' + 3y' - y = 0, \quad y(0) = 2; \quad y'(0) = 2; \quad y''(0) = 10.$

26. $(D^4 + 10D^2 + 9)y = 0, \quad y(0) = 0; \quad y'(0) = 0; \quad y''(0) = 32; \quad y'''(0) = 0.$

Find the general solution.

27. $x^2 y'' - 20y = 0.$

30. $4x^2 y'' + 12xy' + 3y = 0.$

28. $10x^2 y'' + 46xy' + 32.4y = 0.$

29. $x^2 y'' + xy' + y = 0.$

31. $x^2 y'' + 1.25y = 0.$

Solve the following initial value problem.

32. $4x^2 y'' + 24xy' + 25y = 0, \quad y(1) = 2; \quad y'(1) = -6.$

33. $x^2 y'' - 3xy' + 4y = 0, \quad y(1) = 0; \quad y'(1) = 3.$