1. $\frac{dy}{dx} = \frac{y \cos x}{1+2y^2}$

2. $(x^2 + y^2)dx + (x^2 - xy)dy = 0$

3. $2xe^y + (\, x^2e^y + \cos y)\frac{dy}{dx} = 0$

4. $\frac{dy}{dx} + 2y = e^x\sqrt{y}$

5. $y'' - 9y = 0 \qquad y(0) = 1\,, y'(0) = 3$

6. $4\frac{d^2y}{d^2x} - 4\frac{dy}{dx} + y = 0$

7. $y'' + y' + y = 0$

8. $e^y \ \sin 2x\, dx + \cos x(\ e^{2y} - y)\, dy = 0$

9. $\frac{dy}{dx} = \frac{xy}{x^2-y^2}$

10. $(2xy - sec^2x\ )dx + (x^2 + 2y)dy = 0$

11. $xy' + 2y = \frac{e^{3x}}{x}$

12. $3y'' - 14y' - 5y = 0$

13. $y'' - 4y' + 4y = 0 \qquad y(0) = 1\,, y'(0) = 1$

14. $2\frac{d^2y}{d^2x} + 6\frac{dy}{dx} + 5y = 0$

15. $(1 + x)\frac{dy}{dx} = x + 6$

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

17. $(e^y + 1)^2 e^{-y} dx + (e^x + 1)^3 e^{-x} dy = 0$

18. $(ye^x - x)dx + e^x dy = 0$

19. $2y\,dx\ +\ x\,dy\ =\ 0$

20. $(3x^2 e^y - x^2)dx + (x^3 e^y + y^2)dy = 0$

21. $(1 + e^x y + xe^x y)dx + (xe^x\ + 2)dy = 0$

22. $\frac{dy}{dx} - y = 0$

23. $\frac{dy}{dx} + \frac{2y}{x}\ = 6x^3$

24. $y' + \tan(x)y = cos^2(x), y(0) = 2$

25. $\frac{dy}{dx} = y + y^3$

26. $2y''+6y'+5y = 0$

27. $y'' - 2y' - 3y = 0$

28. $y'' - 6y' + 9y = 0$

29. $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} = 0$

30. 4y''-12y'+5y=0

31. 4y''+y=0

32. y''-8y'+16y=0

33. y''+9y=0

34. $\frac{dy}{dx} + \frac{y}{x} = 2$

35. $\frac{dy}{dx} - \frac{4y}{x} = x^2e^x$

36. $\frac{dy}{dx} - \frac{2y}{x} = 0$

37. $\frac{dy}{dx} + \frac{1}{x}y = 3y^3$

38. $\frac{dy}{dx} - y = e^x y^2$

39. $\frac{dy}{dx} = \frac{y^2 - 2xy}{x^2 - 2xy}$

40. $\frac{dy}{dx} = \frac{xy - 2y^2}{x^2 - 3xy}$

41. $x(y - x)\frac{dy}{dx} = y^2$

42. $\frac{dy}{dx} = \frac{y}{x} - \frac{y^2}{x^2}$

43. $2\frac{dy}{dx} = \frac{y}{x} - \frac{y^2}{x^2}$

44. $(x + 1)ydx + (x - 1)(y + 1)dy = 0$

45. $(xy + y)dx + (y^2x - y^2 - x + 1)dy = 0$

46. $dx + e^{3x}dy = 0$

47. $\frac{dx}{dy} = \frac{x^2 \ \ y^2}{1+x}$

48. $\frac{dy}{dx} = e^{(3x+2y)}$

49. $2y(x+1)dy = xdx$

50. $(4y + y\,x^2)dy - (2x + xy^2\,)dx = 0$