$$y \equiv y(x), \quad y' \equiv \frac{dy(x)}{dx}$$

1. $xy\ dx + (x+1)dy = 0$
2. $(x^2-1)y' + 2xy^2 = 0$
3. $y'\mathrm{ctg}y + y = 2$
4. $y' = 10^{x+y}$
5. $y' = \cos(y-x)$
6. $y' - y = 2x - 3$
7. $y' = \sqrt{4x+2y-1}$
8. $x^2y' - \cos(2y) = 1\ , \quad y(+\infty) = \frac{9\pi}{4}$
9. $3y^2y' + 16x = 2xy^3\ , \quad y(+\infty) < \infty$
10. $y' = 3\sqrt[3]{y^2}$

11. $(x+2y)dx - xdy = 0$
12. $(x-y)dx + (x+y)dy = 0$
13. $(y^2-2xy)dx + x^2dy = 0$
14. $2x^3y' = y(2x^2-y^2)$
15. $y^2 + x^2y' = xyy'$
16. $xy' = y\cos(\ln\frac{y}{x})$
17. $xy' - y = (x+y)\ln\frac{x+y}{x}$
18. $xy' = \sqrt{x^2-y^2} + y$
19. $x - y - 1 + (y-x+2)y' = 0$
20. $(x+4y)y' = 2x + 3y - 5$

21. $y' = 2\Big(\dfrac{y+2}{x+y-1}\Big)^2$
22. $(y'+1)\ln\dfrac{y+x}{x+3} = \dfrac{y+x}{x+3}$
23. $y' = \dfrac{y+2}{x+1} + \mathrm{tg}\dfrac{y-2x}{x+1}$
24. $2y' + x = 4\sqrt{y}$
25. $y' = y^2 - \dfrac{2}{x^2}$
26. $2xy' + y = y^2\sqrt{x - x^2y^2}$
27. $\dfrac{2}{3}xyy' = \sqrt{x^6 - y^4} + y^2$
28. $2y + (x^2y + 1)xy' = 0$
29. $2x^2dy + (x^2y^4 + 1)ydx = 0$
30. $ydx + x(2xy + 1)dy = 0$

31. $(2x+1)y' = 4x + 2y$
32. $y' + y\mathrm{tg}x = \sec x$
33. $xy' = (xy + e^x)$
34. $(xy' - 1)\ln x = 2y$
35. $(2e^y - x)y' = 1$
36. $(\sin^2 y + x\mathrm{ctg}y)y' = 1$
37. $y' = \dfrac{y}{3x - y^2}$
38. $y' + 2y = y^2e^x$
39. $xy^2y' = x^2 + y^3$
40. $xy' + 2y + x^5y^3e^x = 0$

41. $(x + y^2)dy = ydx$
42. $(2x + y)dy = ydx + 4\ln\ y\ dy$
43. $(x+1)(y' + y^2) = -y$
44. $(1 - 2xy)y' = y(y-1)$
45. $y' = y^4\cos x + y\mathrm{tg}x$
46. $xydy = (y^2 + x)dx$
47. $xy' - 2x^2\sqrt{y} = 4y$
48. $2y' - \dfrac{x}{y} = \dfrac{xy}{x^2 - 1}$
49. $y'x^3\sin y = xy' - 2y$
50. $(2x^2y\ln y - x)y' = y$

61. $x^2y' + xy + x^2y^2 = 4$
62. $3y' + y^2 + \dfrac{2}{x^2} = 0$
63. $xy' - (2x+1)y + y^2 = -x^2$
64. $y' - 2xy + y^2 = 5 - x^2$
65. $y' + 2ye^x - y^2 = e^{2x} + e^x$
66. $y' = y^2 + nx^{n-1} - x^{2n}$
67. $y' = -(n+1)x^n y^2 + ax^{n+m+1}y - ax^m$
68. $y' = ax^n y^2 - ax^n$
69. $2x^2y' = 2y^2 + 3xy - 2x$
70. $(x^n + x^m + c)y' = xy^2 - a^2x$

71. $y' = ay^2 + be^x$
72. $y' = -ae^{ax}y^2 - \dfrac{a}{3}x^n + \dfrac{1}{3}x^n e^{ax}y$
73. $y' = 2x^n y^2 + 6e^{3x} - 8x^n e^{6x}$
74. $y' = y^2 + 4 - 8\mathrm{th}^2(2x)$
75. $y' = 2y\cos^2 x - \sin x$(find periodic solution only)
76. $y = \displaystyle\int_0^x y(t)dt + x + 1$

$77*$. $\displaystyle\int_0^x (x-t)y(t)dt = 2x + \int_0^x y(t)dt$