

Some Non-Standard Differential Equations

1.  $y dx + (1 + ye^x) dy = 0.$

10.  $y \frac{dy}{dx} + 2x \ln x = xe^y.$

2.  $(2 + e^{-x/y}) dx + 2 \left(1 - \frac{x}{y}\right) dy = 0.$

11.  $y'' + (y')^2 + 1 = 0.$

3.  $y' + y \ln y = ye^x.$

12.  $xy'' = y' + x(y')^2.$

4.  $\frac{dy}{dx} - \frac{4}{x}y = 2x^5 e^{y/x^4}.$

13.  $xy'' = y' + (y')^3.$

5.  $\frac{dy}{dx} + x + y + 1 = (x + y)^2 e^{3x}.$

14.  $x^2 y'' + (y')^2 = 0.$

6.  $y' = y + x(y + 1)^2 + 1.$

15.  $y' - xy'' - (y'')^3 = 1.$

7.  $x^2 \frac{dy}{dx} + 2xy = x^4 y^2 + 1.$

16.  $y'' = 1 + (y')^2.$

8.  $xe^y y' - 2e^y = x^2.$

17.  $xy'' - y' = 0.$

9.  $y' + 1 = e^{-(x+y)} \sin x.$

18.  $y'' + 2y(y')^3 = 0.$