

MA/PHY506 Fall 2018
Problem Set 1
DUE: Friday, 31 August 2018

1. First order ODE: Find the most general solutions to:

(a)

$$(s^2 + 1)f'(s) + sf(s) = 0.$$

(b)

$$ty'(t) + 2y(t) = t^2 - t$$

(c)

$$2x + y + xy'(x) = 0, \quad \text{let } v = \frac{y}{x}.$$

2. Second order constant coefficient ODEs:

(a) Arfken, Chapter 7, page 343, problem 7.3.4.

(b) Find the most general real solution of $y''(x) + 5y'(x) + 6y(x) = 0$ by finding a basis of the solution space (verify that the functions are linearly independent.)