

**MA/PHY506 Fall 2017**  
**Problem Set 2**  
**DUE: Wednesday, 13 September 2017**

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

(a) 
$$(2xy^2 + 2y) + (2x^2y + 2x)y' = 0$$

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

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

2. Arfken, Chapter 7, page 341: 7.2.13.

3. Second order ODE:

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

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