

# Exercise 1

November 18, 2016

1.a) Find the general solution to :

$$y'(x) = \frac{y(x) - 1}{x + 2}$$

1.b) If  $y(1)=7$  find  $y(-1)$ .

2.a) Find the general solution to :

$$y(x)y'(x) = e^{x+y^2}$$

2.b) If  $y(0)=2$  find  $y(1)$ .

3) Find the general solution to:

$$y'(x)\tan(x) + y(x) = 2\sin(x) \quad \text{where: } 0 < x < \frac{\pi}{2}$$

4) Find the solution to Sturm Liouville problem :

$$\begin{cases} y''(x) + \lambda y(x) = 0, & 0 \leq x \leq L \\ y'(0) = y'(L) = 0 \end{cases}$$

5) Find the solution to Sturm Liouville problem :

$$\begin{cases} y''(x) + \lambda y(x) = 0, & -L \leq x \leq L \\ y(-L) = y(L) \\ y'(-L) = y'(L) \end{cases}$$