Problem Sheet 8

Module F13YT2

1. Solve the following boundary value problem by using an appropriate Green's function:

$$y''(x) + 4y(x) = f(x);$$
 $y(0) = 0,$ $y'(1) = 0.$

2. Consider the boundary value problem

$$y''(x) = f(x);$$
 $y(-1) = 0,$ $y(1) = 0.$

- (a) Find the Green's function.
- (b) Show that the Green's function you found in (a) satisfies

$$\frac{\partial^2 G}{\partial s^2}(x,s) = \delta(s-x).$$

3. Solve the following boundary value problem by using an appropriate Green's function: $x^2y''(x) + 4xy'(x) + 2y(x) = x;$ y(1) + y'(1) = 0 = y(2) + y'(2), $1 \le x \le 2$