

## Exercise 1

Consider the problem

$$\frac{d^2u}{dx^2} + u = 0$$
$$u(0) = 0 \quad \text{and} \quad u(L) = 0,$$

consisting of an ODE and a pair of boundary conditions. Clearly, the function  $u(x) \equiv 0$  is a solution. Is this solution *unique, or not*? Does the answer depend on  $L$ ?