

**Exercise 2.2.2**

(a) Show that  $L(u) = \frac{\partial}{\partial x} \left[ K_0(x) \frac{\partial u}{\partial x} \right]$  is a linear operator.

(b) Show that usually  $L(u) = \frac{\partial}{\partial x} \left[ K_0(x, u) \frac{\partial u}{\partial x} \right]$  is not a linear operator.