

**Exercise 14**

Solve the eigenvalue problem  $x^2u'' + 3xu' + \lambda u = 0$  for  $1 < x < e$ , with  $u(1) = u(e) = 0$ . Assume that  $\lambda > 1$ . (*Hint*: Look for solutions of the form  $u = x^m$  for complex  $m$ .)