**1.** Find the Green's function for the Bessel operators

a) $Lu = -\dfrac{d}{dx} x \dfrac{du}{dx}$

b) $Lu = -\dfrac{d}{dx} x \dfrac{du}{dx} + \dfrac{n^2}{x} u$

with the boundary conditions $u(0)$ finite and $u(1) = 0$.

**2.** a) Find the Green's function for the problem

$$L = -\frac{d^2}{dx^2} + \omega^2, \quad u(a) = 0, \ u(b) = 0$$

for $a < b$ and $\omega$ a constat.

b) Does this Green's function exist for all values of $\omega$? If not, then what are the exceptional values for $\omega$?

**3.** Find (as an integral) the solution to the boundary value problem

$$u'' + 3u' = f, \quad u(0) = 1, \ u'(1) = 6$$

**4.** Find the Green's function for the problem

$$u''' = f, \quad u(0) = 0, \ u''(0) = 0, \ u'(1) = 0$$