

Exercise 1

Find the one-dimensional Green's function for the interval $(0, l)$. The three properties defining it can be restated as follows.

- (i) It solves $G''(x) = 0$ for $x \neq x_0$ ("harmonic").
- (ii) $G(0) = G(l) = 0$.
- (iii) $G(x)$ is continuous at x_0 and $G(x) + \frac{1}{2}|x - x_0|$ is harmonic at x_0 .