

Exercise 12

Derive the solution of the fully inhomogeneous wave equation on the half-line

$$\begin{aligned}v_{tt} - c^2 v_{xx} &= f(x, t) \quad \text{in } 0 < x < \infty \\v(x, 0) &= \phi(x), \quad v_t(x, 0) = \psi(x) \\v(0, t) &= h(t),\end{aligned}$$

by means of the method using Green's theorem. (*Hint:* Integrate over the domain of dependence.)