

Exercise 1

Solve the inhomogeneous diffusion equation on the half-line with Dirichlet boundary condition:

$$\begin{aligned}u_t - ku_{xx} &= f(x, t) & (0 < x < \infty, \quad 0 < t < \infty) \\u(0, t) &= 0 & u(x, 0) = \phi(x)\end{aligned}$$

using the method of reflection.