

Exercise 33

Find the solution of the inhomogeneous equation

$$\begin{aligned}\frac{1}{c^2}u_{tt} - u_{xx} &= k \sin\left(\frac{\pi x}{a}\right), & 0 < x < a, t > 0, \\ u(x, 0) = 0 &= u_t(x, 0) & \text{for } 0 < x < a, \\ u(0, t) = 0 &= u(a, t) & \text{for } t > 0.\end{aligned}$$