

Write a solution of the boundary value problem.

$$\frac{\partial u}{\partial t} = 3 \frac{\partial^2 u}{\partial x^2} \quad \text{for } 0 < x < L, t > 0$$

$$u(0, t) = u(L, t) = 0 \quad \text{for } t \geq 0$$

$$u(x, 0) = L \left[ 1 - \cos\left(\frac{2\pi x}{L}\right) \right] \quad \text{for } 0 \leq x \leq L$$