Name Waseem Khan
ID 7337
assig ※ 03

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Application of Partial differential

The heat equation is important eq which describe the distribution of heat in a given region over time the equation in one spetial dimension can be stated

$$\frac{\partial u}{\partial t} = k\frac{\partial^2 u}{\partial^2 x}$$

where u (x,t) describe temprature at give location x and time t and k is thermal difficency

Consider the follwing

A one dimensional bar of length has a uniform intial temprature However cooling are located at each end of bar that describe a temp of one

The temp at any location and time $u(x,t)$ satisfie (1) with boundry condition $u(0,t)$ and $u(1,t) = a$ verify that

$$u(x,t) \sum_{n=1}^{m} \frac{40}{nc} (1-(-1)^n) e^{\ln x^2 x} \sin(x-)$$

Solution to the heat equation

$$\frac{\partial u}{\partial t} = \frac{k \partial u}{\partial x^2}$$

$u(0,t) = 0$ ~~Desde~~ Describe tem

$0°c$ at $x = 0$

$u \cdot (1,t) = 0$ Describe tem $0°c$ $a = 1$