

MATH 454 Homework #5

(1) Consider the problem

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

in the domain $x \in [0, \pi]$ with boundary conditions

$$\frac{\partial u}{\partial x}(0, t) = u(0, t) \quad \text{and} \quad \frac{\partial u}{\partial x}(\pi, t) = -u(\pi, t)$$

Find the critical value of B , B_c , so that if $B < B_c$ then $\lim_{t \rightarrow \infty} u(x, t) = 0$