

prod Sol $X(x)T(t)$

Theorem $T(t) = T(0)e^{-k\lambda t}$

BVP has a sol $X(x) \neq 0$ if
and only if $\lambda > 0$, $\sqrt{\lambda}L = n\pi$
for $n=1, 2, 3, \dots$ and
 $X(x) = C \sin(\sqrt{\lambda}x/L)$

Kod Problem

PDE $u_t = k u_{xx}$

BC $u = 0$ at $x=0, x=L$

IC $u(x, 0) = f(x)$