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HW 05

Lets say the length of the rod is L. The rod is laterally insulated so the PDE takes the form of $u_t = \alpha^2 u_{xx}$. Initial temperature of 20°gives us $u(x,0) = 20$. One end fixed at 50°gives us $u(0,t) = 50$. The other end being immersed in 30°liquid gives us $u_x(L,t) = -\lambda[u(L,t) - 30]$ Putting it all together we have:

PDE	$u_t = \alpha^2 u_{xx}$	$0 < x < L$	$0 < t < \infty$
BCs	$\begin{cases} u(0,t) = 50 \\ u_x(L,t) = -\lambda[u(L,t) - 30] \end{cases}$	$0 < t < \infty$	
IC	$u(x,0) = 20$	$0 \leq x \leq L$	