Q.1: Find the temperature $u(x, t)$ in a rod of length $L$ is the initial temperature is $L - x$

and if the ends $x = 0$ and $x = L$ are insulated.
Q.2: Solve the wave equation 
\[ a^2 \frac{\partial^2 u}{\partial x^2} = \frac{\partial^2 u}{\partial t^2} \] subject to the conditions 
\[ u(x, 0) = \sin(2\pi x) + \sin(5\pi x), \quad u(0, t) = 0 \text{ and } u_t(1, t) = 0 \]