homework 7

1. 求解下面定解问题

$$
\begin{cases}
u_{tt} + 2hu_t = a^2 u_{xx}, & t > 0, 0 < x < l \\
u(t,0) = u(t,l) = 0 \\
u(0,x) = \varphi(x), & u_t(0,x) = \psi(x)
\end{cases}
$$

其中 h 为常数, $0 < h < \frac{\pi a}{l}$.

2. 求解

$$
\begin{cases}
u_{tt} - u_{xx} = \sin \frac{x}{2} & (0 < x < \pi, t > 0) \\
u|_{x=0} = 1, & u_x|_{x=\pi} = \pi \\
t = 0: & u = \pi x + \sin \frac{x}{2} + 1, \quad u_t = 0
\end{cases}
$$