

$$u_{tt} = u_{xx}, \quad t > 0, \quad x \in \mathbb{R}$$

$$\begin{aligned} u(0, x) &= \varphi(x), & x \in \mathbb{R} \\ u_t(0, x) &= 0, & x \in \mathbb{R} \end{aligned}$$

$$\varphi(x) = \begin{cases} \frac{1}{2}(1 + \cos x), & |x| \leq \pi \\ 0, & |x| > \pi \end{cases}$$

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$$\begin{aligned} u(0, x) &= 0, & x \in \mathbb{R} \\ u_t(0, x) &= \psi(x), & x \in \mathbb{R} \end{aligned}$$

$$\psi(x) = \begin{cases} \frac{1}{2}(1 + \cos x), & |x| \leq \pi \\ 0, & |x| > \pi \end{cases}$$

$$u_{tt} = u_{xx} + f(t, x), \quad t > 0, \quad x \in \mathbb{R}$$

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$$f(t, x) = \begin{cases} \frac{1}{100} \sin(300t) \frac{1}{2}(1 + \cos x), & |x| \leq \pi \\ 0, & |x| > \pi \end{cases}$$

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$$f(t, x) = \begin{cases} \frac{1}{100} \sin(100\pi t) \frac{1}{2}(1 + \cos x), & |x| \leq \pi \\ 0, & |x| > \pi \end{cases}$$



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$$\varphi(x) = \begin{cases} \frac{1}{2}(1 + \cos(x - 10)), & |x - 10| \leq \pi \\ 0, & |x - 10| > \pi \end{cases}$$

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$$u_t(0, x) = 0, \quad x > 0$$

$$u(t, 0) = \sin t, \quad t > 0$$

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$$u_t(0, x) = 0, \quad x > 0$$

$$u_x(t, 0) = \sin t, \quad t > 0$$

$$\begin{aligned}
u_{tt} &= u_{xx}, & t > 0, \quad 0 < x < 1 \\
u(0, x) &= \varphi(x), & 0 < x < 1 \\
u_t(0, x) &= 0, & 0 < x < 1 \\
u(t, 0) &= 0, & t > 0
\end{aligned}$$

$$\varphi(x) = \begin{cases} 1,1704x, & x < 0,8528, \\ \cos 14(x - \frac{6}{7}), & 0,8528 \leq x \leq 0,9022, \\ 8,2577(x - 1), & x > 0,9022 \end{cases}$$

$$\begin{aligned}u_{tt} &= u_{xx}, & t > 0, 0 < x < 1 \\u(0, x) &= 0, & 0 < x < 1 \\u_t(0, x) &= \psi(x), & 0 < x < 1 \\u(t, 0) &= 0, & t > 0\end{aligned}$$

$$\psi(x) = \begin{cases} \frac{1}{2}(1 + \cos 28(x - \frac{6}{7})), & 28|x - \frac{6}{7}| \leq \pi \\ 0, & 28|x - \frac{6}{7}| > \pi \end{cases}$$



$$u_{tt} = u_{xx} + f(x), \quad t > 0, 0 < x < 1$$

$$\begin{aligned} u(0, x) &= 0, & 0 < x < 1 \\ u_t(0, x) &= \psi(x), & 0 < x < 1 \\ u(t, 0) &= 0, & t > 0 \end{aligned}$$

$$f(x) = \begin{cases} \frac{1}{100}(1 + \cos 28(x - \frac{6}{7})), & 28|x - \frac{6}{7}| \leq \pi \\ 0, & 28|x - \frac{6}{7}| > \pi \end{cases}$$