

$$u_t = 4u_{xx}, \quad t > 0, \quad x \in \mathbb{R}$$

$$u(0, x) = \varphi(x), \quad x \in \mathbb{R}$$

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

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$$\begin{aligned} u(0, x) &= \varphi(x), & x > 0 \\ u(t, 0) &= 0, & t > 0 \end{aligned}$$

$$\varphi(x) = \begin{cases} \frac{1}{2\pi}(1 + \cos(x - 11)), & |x - 11| \leq \pi \\ 0, & |x| > \pi \end{cases}$$

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$$u_t = 4u_{xx}, \quad t > 0, 0 < x < l$$

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$$u_t = 4u_{xx}, \quad t > 0, \quad x > 0$$

$$u(t, 0) = \frac{3}{10} \cos \frac{1}{4}t, \quad t > 0$$

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$$u(0, x) = 0, \quad 0 < x < l$$

$$u(t, 0) = 1, \quad u(t, l) = 0, \quad t > 0$$

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$$u_t = 4u_{xx},$$

$$t > 0, 0 < x < l$$

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

$$0 < x < l$$

$$u(t, 0) = 1, u_x(t, l) = -u(t, l),$$

$$t > 0$$