Math 631: Problem Set 3 due in class Monday, March 21

1. Evans p.86: 10
2. Evans p.88: 18
3. Evans p.88: 19
4. Evans p.88: 24
5. Solve $u_{tt} - u_{xx} = 0$ on $(0, L) \times (0, \infty)$

$$u = g, \; u_t = 0 \quad \text{on } (0, L) \times \{t = 0\} \quad u = 0 \text{ on } (\{0\} \cup \{L\}) \times (0, \infty) \; .$$

by converting to a problem on $R \times (0, \infty)$ using odd reflection.
Conclude that

$$u(x, t) = \frac{1}{2}\{\sum B_n \sin(\frac{n}{\pi}(x + t) + \sum B_n \sin(\frac{n}{\pi}(x - t)\} \; ,$$

where $\sum B_n \sin \frac{n}{\pi}x$ is the Fourier series of the $2L$ periodic odd extension of $g(x)$.