1. Problems 31, 32, and 33; page 249.
2. Problems 36 and 38; pages 250 and 251.
3. Problems 49 and 50: (b) and (d); 52; page 254.
4. Problems 53, 57: (b) and (d); 58: (c); page 255.
5. The Gibbs Phenomenon in Fourier Series:

Consider the function
\[
f(x) = \begin{cases} 
  +1 & 0 \leq x \leq \pi \\
  -1 & -\pi \leq x \leq 0 
\end{cases}
\]  
(1)

(a) Show that its Fourier series is given by
\[
F(x) = \frac{4}{\pi} \sum_{n=1}^{\infty} \frac{\sin[(2n-1)x]}{(2n-1)}.
\]  
(2)

What is the value of \( F(x) \) at \( x = 0, \pm \pi \)?

(b) We define the truncated series
\[
F_N(x) = \frac{4}{\pi} \sum_{n=1}^{N} \frac{\sin[(2n-1)x]}{(2n-1)}.
\]  
(3)

Plot \( F_N(x) \) over the interval \((-2\pi, 2\pi)\) for \( N = 1, 3, 5, 10, 26 \). The overshoot (undershoot) of \( F_N(x) \) at \( x = 0, \pm \pi, \pm 2\pi, \cdots \) is known as the Gibbs phenomenon.