1. Consider the linear operator $Lu(x) = -u''(x) + k^2 u(x)$ on $[0, L]$ with Dirichlet BC where k is a real number. Write the Green's function for

$$-u''(x) + k^2 u(x) = f(x), \quad k \in R$$

two different ways. First, use the eigenfunction expansion for the Sturm-Liouville problem for L. Second, use the variation of parameters method. How are the two representations related?

2. Arfken, chapter 5, page 268, problems 5.1.6 and 5.1.7.

3. Arfken, chapter 5, page 274, problem 5.2.4.

4. Arfken, chapter 5, page 286, problem 5.4.1.