Turn in starred problems Tuesday 11/03/2009.

Section 9.9: 4 (a), (e)*

Section 9.10: 2 (a), (c)*; 3

Section 17.2: 5 (a), (e), (g); 12 (a), (e), (j)*, (s)

Section 17.3: 1, 4 (a), (c)*, (l)*

8.A* Exercise 1 from the notes on Expansions in Orthogonal Bases, available on the web page.

Comments: (a) For the problems in Section 19.10: the best approximation to a given vector within the "span" of some vectors $\{\mathbf{e}_1, \mathbf{e}_2, \ldots\}$ means the best approximation as a linear combination of those vectors.

(b) 17.2 12(j) is a bit tricky—think carefully. On the other hand, 17.3 4(l) is easy, if you use the hint given: with this it can be done by inspection. The two problems are related.

(c) The extra exercise 8.A involves the evaluation of many integrals; these are simple (just polynomials) but it is still a nuisance. **You are welcome to use Maple, Mathematica, or some other program to do these.** If you do so, write the integral out out explicitly before giving the answer. For example, for part (a) you might write

$$\langle f, g\rangle = \int_0^2 f(x)g(x)\,dx = \int_0^2 (1-x)\,dx = 0;$$

$$\langle g, g\rangle = \int_0^2 g(x)^2\,dx = \int_0^2 (1-x)^2\,dx = \frac{2}{3}, \quad \text{so} \quad \|g\| = \sqrt{\langle g, g\rangle} = \sqrt{\frac{2}{3}}.$$