

**Book Problems.** (MacCluer) 1.10 c; 1.12; 1.13; 1.15; 1.24; 1.28.

**Problem 1.** In  $C[0, 1]$ , consider the set  $S$  of functions  $f$  such that

$$\int_0^{1/2} f(t) dt - \int_{1/2}^1 f(t) dt = 1.$$

Prove that  $S$  is nonempty, closed, and convex, but that  $f$  does not possess an element with the least norm.