

Throughout the course, we will use **EK** to refer to the course textbook “Erwin Kreyszig: *Advanced Engineering Mathematics*, 10th edition.”

Problems to be turned in:

EK:

P122: 1, 2 (in Problem set 3.3)

P319: 14, 20

P280: 3, 7

P288: 28

P318: 4, 6 (in Problem set 7.9)

P287: 13

1. Prove that a vector space has a unique additive identity
2. Prove that every element in a vector space has a unique additive inverse
3. For each of the following subsets of \mathbb{F}^3 , determine whether it is a subspace of \mathbb{F}^3 .
 - (a) $\{(x_1, x_2, x_3) \in \mathbb{F}^3 : x_1 + 2x_2 + 3x_3 = 0\}$
 - (b) $\{(x_1, x_2, x_3) \in \mathbb{F}^3 : x_1 = 3x_3\}$
 - (c) $\{(x_1, x_2, x_3) \in \mathbb{F}^3 : x_1 + 2x_2 + 3x_3 = 4\}$