

Analysis in \mathbb{R}^n
Math 205, Section 30
Spring Quarter 2008
Written Exercises from Week 8

Exercise 0.0.1 Let V be a finite-dimensional vector space, and let $\{\varphi_1, \dots, \varphi_n\}$ be a basis for V^* . Show that there exists a basis $\{v_1, \dots, v_n\}$ for V such that:

$$\varphi_i(v_j) = \begin{cases} 1 & , \text{ if } i = j \\ 0 & , \text{ if } i \neq j. \end{cases}$$

Show by example that the same statement is not true if V is infinite-dimensional.