Matrix Theory (EE5609) Assignment 9

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Abstract—**This document uses properties of vector spaces and subspaces.**

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1 PROBLEM

Let **V** be the (real) vector space of all functions f from **R** into **R**. Is $f(3) = 1 + f(-5)$ a subspace of **V**

2 SOLUTION

For each of the function to be a subspace, it must be closed with respect to addition and scalar multiplication in **V** defined as, for f g ϵ **W** and c ϵ $\mathbb{R}$
Then,

$$(f + g)(3) = f(3) + g(3) \tag{2.0.1}$$
$$= 1 + f(-5) + 1 + g(-5) \tag{2.0.2}$$
$$= 2 + f(-5) + g(-5) \tag{2.0.3}$$
$$= 2 + (f + g)(-5) \tag{2.0.4}$$
$$\neq 1 + (f + g)(-5) \tag{2.0.5}$$

Since **W** is not closed with respect to addition $\therefore$ It is not a subspace of **V**.