Problem Set 7, Math 54-Lec 3, Linear Algebra, Fall 2017

SEPTEMBER 18TH, 2017

Problem 1. The set of solutions to the system of linear equations:

$$x_1 - 2x_2 + x_3 = 0$$
$$2x_1 - 3x_2 + x_3 = 0$$

form a subspace of $\mathbb{R}^3$. Find a basis for this subspace.

Problem 2. Let V be a vector space and let $\{\vec{u}, \vec{v}\}$ be a basis for V. Prove that $\{(\vec{u} + \vec{v}), c\vec{u}\}$ is also a basis for V when c is a non-zero constant.

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Problem 3. Determine if the following vectors form a basis for a vector space. If so, what is the vector space?

$$\left\{ \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} \right\}$$