

Math 4133 - Linear Algebra

Quiz #14 - 2013.02.20

Solutions

1. Give two non-trivial examples of subspaces of \mathbb{R}^3 .

Answers will vary. As examples, $\mathbb{V} = \{\vec{v} \in \mathbb{R}^2 \mid \vec{v} = \langle 0, y, 0 \rangle, y \in \mathbb{R}\}$ and $\mathbb{V} = \{\vec{w} \in \mathbb{R}^2 \mid \vec{w} = \langle x, 0, z \rangle, x, z \in \mathbb{R}\}$

2. If \mathbb{U} and \mathbb{V} are two subspaces of \mathbb{R}^n , explain what $\mathbb{U} + \mathbb{V}$ is by describing its elements.

For \vec{z} to be an element of $\mathbb{U} + \mathbb{V}$, \vec{z} must be able to be expressed as $\vec{z} = \vec{u} + \vec{v}$, where $\vec{u} \in \mathbb{U}$ and $\vec{v} \in \mathbb{V}$.