

Objectives: Vector Spaces

By the end of the class discussion of this outline, you will be able to . . .

27. **state** five axioms used in the definition of a real vector space.
28. **describe** three examples of real vector space.
29. **determine** if a subset of a vector space is a subspace.
30. **describe** in your own words how lines and planes can be used to visualize subspaces of $\mathbb{R}^{3 \times 1}$.
31. **calculate** the null space of a matrix.
32. **define** the range of a matrix.
33. **define** the terms *linear dependence* and *linear independence*.
34. **determine** if a set of vectors in $\mathbb{R}^{m \times 1}$ is linearly independent or linearly dependent.
35. **define** the term *basis* for a finitely generated vector space.
36. **describe** three examples of finitely generated vector spaces and give a basis for each vector space.
37. **define** the term *dimension* of a vector space.
38. **describe** an example of a infinite dimensional vector space.