

Module S: Systems of ODEs

What structure do vector spaces have?

At the end of this module, students will be able to...

- S1. Linear independence.** ... determine if a set of Euclidean vectors is linearly dependent or independent.
- S2. Basis verification.** ... determine if a set of Euclidean vectors is a basis of \mathbb{R}^n .
- S3. Basis computation.** ... compute a basis for the subspace spanned by a given set of Euclidean vectors.
- S4. Dimension.** ... compute the dimension of a subspace of \mathbb{R}^n .
- S5. Abstract vector spaces.** ... solve exercises related to standards V3-S4 when posed in terms of polynomials or matrices.
- S6. Basis of solution space.** ... find a basis for the solution set of a homogeneous system of equations.

Readiness Assurance Outcomes

Before beginning this module, each student should be able to...

- Add Euclidean vectors and multiply Euclidean vectors by scalars.
- Perform basic manipulations of augmented matrices and linear systems **E1,E2,E3**.
- Apply linear combinations and spanning sets **V3,V4**.

The following resources will help you prepare for this module.

- Adding and subtracting Euclidean vectors (Khan Academy):
<http://bit.ly/2y8A0wa>
- Linear combinations of Euclidean vectors (Khan Academy):
<http://bit.ly/2nK3wne>
- Adding and subtracting complex numbers (Khan Academy):
<http://bit.ly/1PE3ZMQ>
- Adding and subtracting polynomials (Khan Academy):
<http://bit.ly/2d5SLGZ>