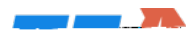


## Linear Algebra

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- (C) use the concept of the projection of a vector to decompose the vector into two components;
  - (D) identify direct proof, proof by contrapositive, proof by contradiction and proof by induction;
  - (E) explain how to negate statements with quantifiers and connectives;
  - (F) discuss how to disprove a statement;
  - (G) describe and perform fundamental operations using matrices;
  - (H) identify the transpose of a matrix and symmetric and skew-symmetric matrices and
  - (I) discuss and perform matrix multiplication and raising square matrices to powers.
- (2) Systems of linear equations. The student uses properties of a matrix to gain additional information about a system of linear equations. The student is expected to:
- (A) solve systems of linear equations using Gauss-Jordan row reduction.



## Linear Algebra

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- (G) decide whether a homogeneous system has a nontrivial solution after calculating the determinant and
- (H) determine the adjoint matrix of a given matrix.
- (4) Vector spaces. The student understands the algebraic structure that defines a vector space. The student is expected to:
  - (A) discuss the meaning and properties of a vector space;
  - (B) determine whether a given set and operation meet the criteria to be called a vector space;
  - (C) explain the meaning of a subspace and determine whether a given subset is also a subspace;
  - (D) identify the meanings of linear combination and span;
  - (E) determine a simplified expression for all vectors in a span using the row space method;
  - (F) determine a simplified expression for all vectors in a span using the row space method;

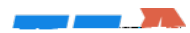


## Linear Algebra

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- (H) identify the term isomorphism;
- (I) find an orthogonal basis for a subspace of  $\mathbb{R}^n$  using the Gram-Schmidt process;
- (J) explain how to determine whether a square nonsingular matrix is orthogonal and
- (K) identify the orthogonal complement of a subspace.

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## Linear Algebra

### Recommended Course Activities:

The teacher introduces students to the vocabulary, concepts, and ~~solving~~ problem-solving processes of linear algebra. Students participate in guided practice with the teacher to master various problemsolving scenarios. Students are assigned homework problems for analysis, independent practice, and mastery. Student progress is evaluated by tests. Students do a stock market project related to linear ~~data~~ algebra, resulting in a research paper and class presentation. Students watch videos, hear presentations by guest speakers, and take field trips to bridge the gap between the classroom and the ~~world~~ world of work.

### Suggested methods for evaluating student outcomes:

Test grades given forevaluations of learning of vocabulary, notation and problem-solving.  
Group quizzes will be used to allow students to explore harder proof based problems in small groups.

### Teacher qualifications:

Secondary Teaching Certification in Mathematics

Recommended: Master Degree with at least 15 graduate hours in mathematics and continuing education in mathematics through graduate courses, summer workshops and staff development training

### Additional information: