(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

(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;

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(H) identify the term isomorphism;

(I) find an orthogonal basis for a subspace of 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 identienj EMC /LBody <</MCID[(taee)]TJ 0 Tc 0 Tw
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Recommended Course Activities:

The teacher introduces students to the vocabulary, concepts, and problem-solving processes of linear algebra. Students participate in guided practice with the teacher to master various problem-solving 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 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 real-world of work.

Suggested methods for evaluating student outco mes:

Test grades given for evaluations 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 Certificate in Mathematics

Recommended: Master s 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: