

Source:

1 | Definitions

1.1 | **DONE** group

A set and binary operation that satisfies Group Properties

- Closed
- Identity
- Inverse
- Associative

1.2 | **DONE** field

A set and two binary operations: the primary (addition) and secondary (multiplication) that "mostly" satisfies group properties for both operations, and are **commutative and distributive**. It must be a group under the primary operation and a group under the secondary operation except without a secondary inverse for the primary identity.

1.3 | **DONE** non-singular matrices

singular matrix: has no inverse. non-singular matrix: has an inverse aka determinant non zero

2 | Connections

2.1 | **DONE** connect direct sum and linear independence

the sum of two spaces is direct if their bases are linearly independent

2.2 | **TODO** matrices to represent complex numbers

3 | Computation

3.1 | **DONE** Find the determinant of matrices

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

3.2 | **TODO Find equations of lines and planes using cross product and dot product**

4 | **Derivations**

4.1 | **TODO properties of the determinant**

4.2 | **TODO inverse of a 2x2 matrix**

5 | **review quizzes**

5.1 | **TODO first quiz**

5.1.1 | **see "find equations of lines and planes using cross product and dot product"**

5.1.2 | **TODO rotation matrices?**

5.1.3 | **TODO compute cross product**

5.2 | **TODO quick linear quiz**

5.3 | **TODO linear independence quiz**

5.4 | **TODO linear independence and bases**