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 indentity.

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 basises 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 | DONE compute cross product

$$\begin{pmatrix} a \\ b \\ c \end{pmatrix} \times \begin{pmatrix} d \\ e \\ f \end{pmatrix} = \begin{vmatrix} i & j & k \\ a & b & c \\ d & e & f \end{vmatrix} = i \begin{vmatrix} b & c \\ e & f \end{vmatrix} + j \begin{vmatrix} c & a \\ f & d \end{vmatrix} + k \begin{vmatrix} a & b \\ d & e \end{vmatrix} = bf - ce, cd - fa, ae - bd$$

3.3 | **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**

4.3 | **TODO rotation matrices**

5 | **review quizzes**

5.1 | **DONE first quiz**

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

5.1.2 | **rotation matrices**

5.1.3 | **cross product**

5.2 | **DONE mini take home quiz**

no feedback

5.3 | **DONE linear independence quiz**

teacher gave no problems

5.4 | **DONE quick linear quiz (linear independence and bases)**

no feedback, I think that quiz was pretty solid..