The Elements of Linear Algebra
Volume One: Livre des Lignes Droites

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CONTENTS

The Equation of a Line in the Plane

Outline

- points vs physics vectors vs math vectors
- the idea of R2
- sketching points and vectors in the plane
- vector algebra in R2
- lines in R2 as parametric objects: through the origin, and not
- sketching lines in R2
- lengths, angles, and the dot product in R2
- normal vector to a line in R2
- equation of a line, three methods: elimination, from two pts via similar triangles, from geometry of dot product
- families of parallel lines
- sketching a line from an equation
- the big theorem with duality

The Equations of a Line in Space

Outline

- points, vectors in space
- R3
- vector algebra
- planes in R3 parametrically: through the origin, not
- dot product in R3
- normal vector to a plane
- the equation of a plane: by elimination, by dot product
- families of parallel planes
- sketching from an equation
- big theorem with duality for planes
- LINES in R3 as intersection of two planes

Systems of Lines in the Plane

Systems of Planes in Space

The Algebra of Square Matrices

Approximate Solutions to Unsolvable Systems

Matrices as Transformations