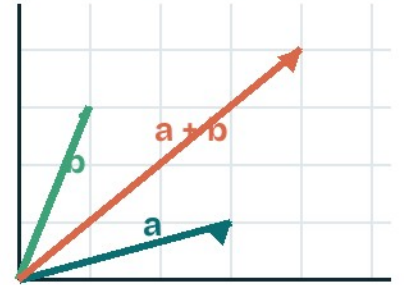


Linear Algebra

Working with many numbers at once

WHAT IS IT?

Linear algebra studies vectors (lists of numbers drawn as arrows with size and direction) and matrices (tables of numbers). It solves many equations together and describes how things stretch, rotate and move.



THE BIG IDEAS

- 1 A vector has size and direction, written as a list of numbers.
- 2 A matrix is a table that can transform vectors.
- 3 Many linear equations can be solved together.
- 4 Some directions are only stretched, not turned, by a matrix: eigenvectors.

YOU SEE IT WHEN ...

Computer graphics and games

Search engines and recommendations

Machine learning and data science

WORDS YOU WILL MEET

Vector

a quantity with size and direction

Matrix

a rectangular table of numbers

Linear combination

adding scaled vectors together

Determinant

a number showing how a square matrix scales area

Eigenvector

a direction a matrix only stretches, shrinks or flips

Dimension

the number of independent directions in a space

GOOD TO KNOW FIRST

Solving systems of equations and basic coordinate geometry.

IN YOUR COURSE YOU WILL ...

- Vectors and their operations
- Solving systems with row reduction
- Matrix multiplication
- Eigenvalues and applications

Start tip: Draw 2D vectors as arrows before working with larger tables.