

Math 369: Day 1

Syllabus

Introductions

What is linear algebra?

Before I say what it is, let me say that it is used in virtually every branch of mathematics. Moreover, it is the

heart of countless applications to science, engineering, computer science, etc. Whenever someone uses the words "linear model" or "regression analysis" or "best fit" or "Markov chain", there's linear algebra going on.

Ex: Google's PageRank algorithm (essentially) boils down to finding eigenvectors.

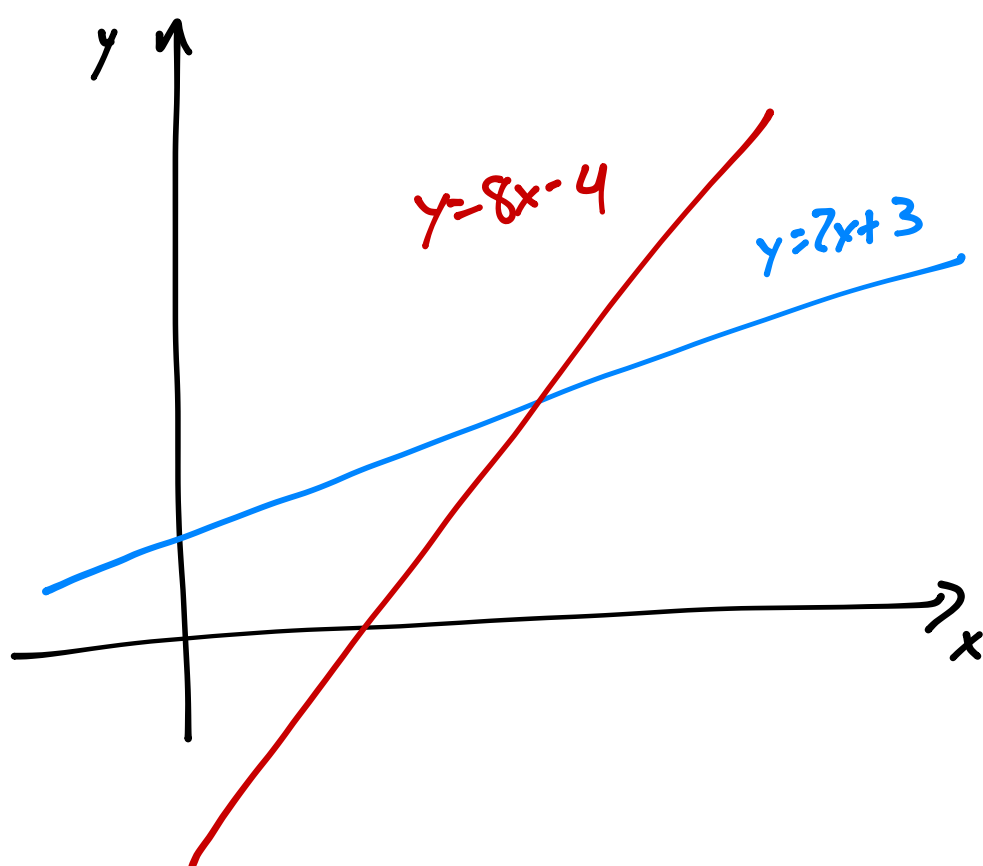
As to what linear algebra is, at its heart is a collection of tools for solving systems of linear equations.

Ex: $y = 2x + 3$
 $y = 8x - 4$

System of linear equations
b/c more than one
only terms of the form
constant or
constant $\cdot$ variable
equalities & not, say, inequalities or statements

Solving the system means finding some value of x that satisfies both equations simultaneously.

Geometrically, solving the system means finding the point where the 2 lines intersect.



$$2x + 3 = 8x - 4$$

$$7 = 6x$$

$$x = 7/6 \Rightarrow y = 2(7/6) + 3 = 7/3 + 3 = 16/3 = 5\frac{1}{3}$$

So the point of intersection is $(7/6, 16/3)$.