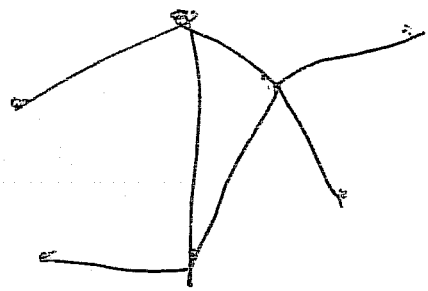
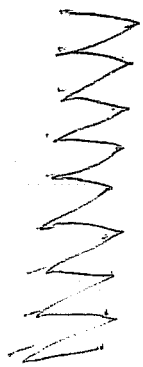
- ~~what Sudoku is~~
- ~~There is a relation to an area called graph theory.~~

Graph Theory

A graph is a bunch of points (called vertices), with some of the points connected by lines (called edges).

Ex





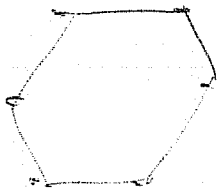
A coloring of a graph is:

Imagine you have some buckets of different color paints, and some little tiny paintbrushes.

You will paint the vertices of the graph different colors, and the only rule is that if two vertices are connected, they can't have the same color.

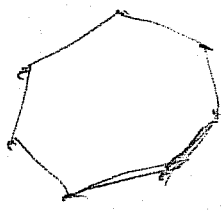
So, let's try.

(1) You have:
Red
Green

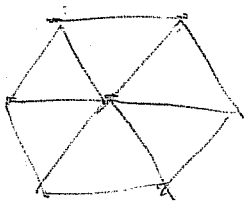


[Have them come up]

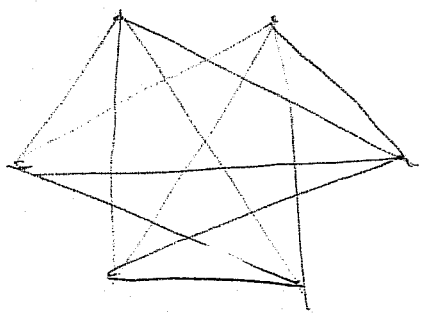
(2) Red
Green



(3) Red
Green
Blue

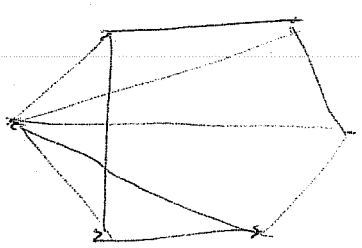


(4) Red
Green
Blue



"Which looks more complicated"

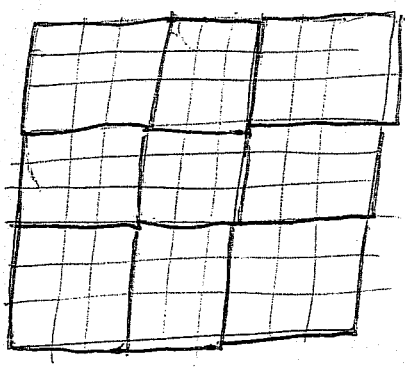
(5) Red
Green
Blue



This "reduces to ~~a~~ previous case."

Sudoku

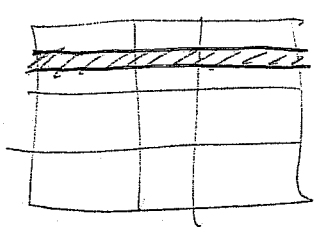
Like a crossword puzzle.
Get a 9x9 grid.
Break it into 3x3 subblocks.



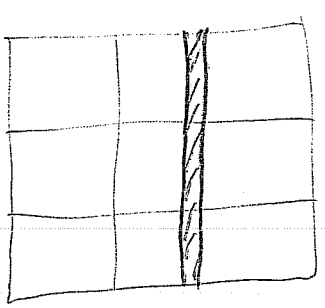
We want to put the numbers 1-9 fill the grid by putting a number from 1-9 in each square.

Rules:

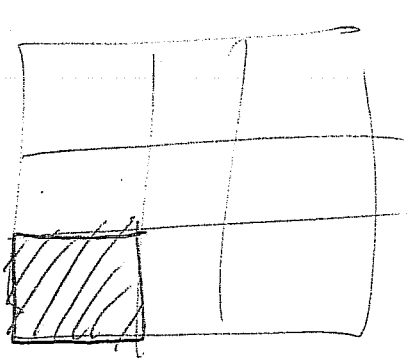
1. Each row must have all diff. #'s



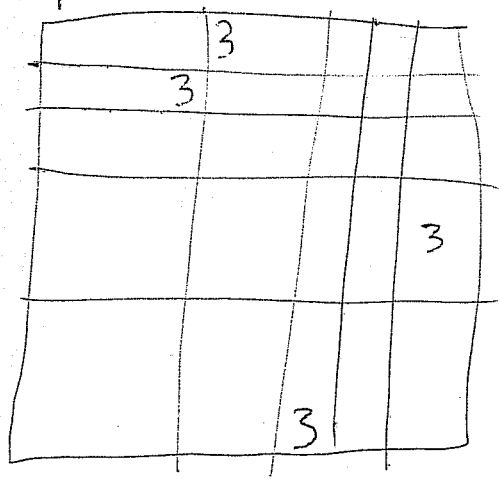
2. Each column must have all diff #'s



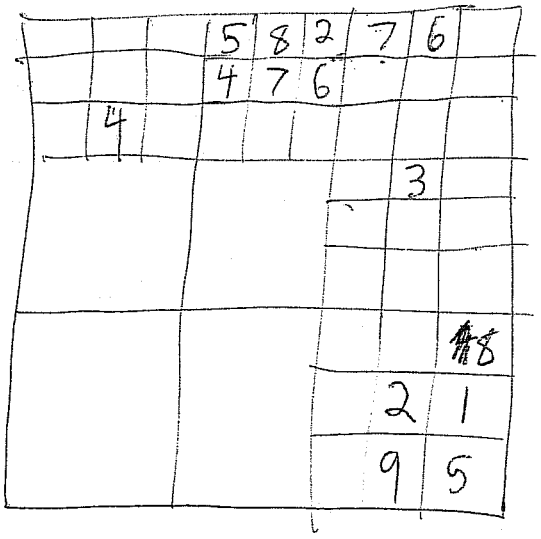
3. Each 3x3 block must have all diff. #'s



Examples



More complicated:



Now, this was originally going to be a talk just about Sudoku, bcs there are many interesting things.

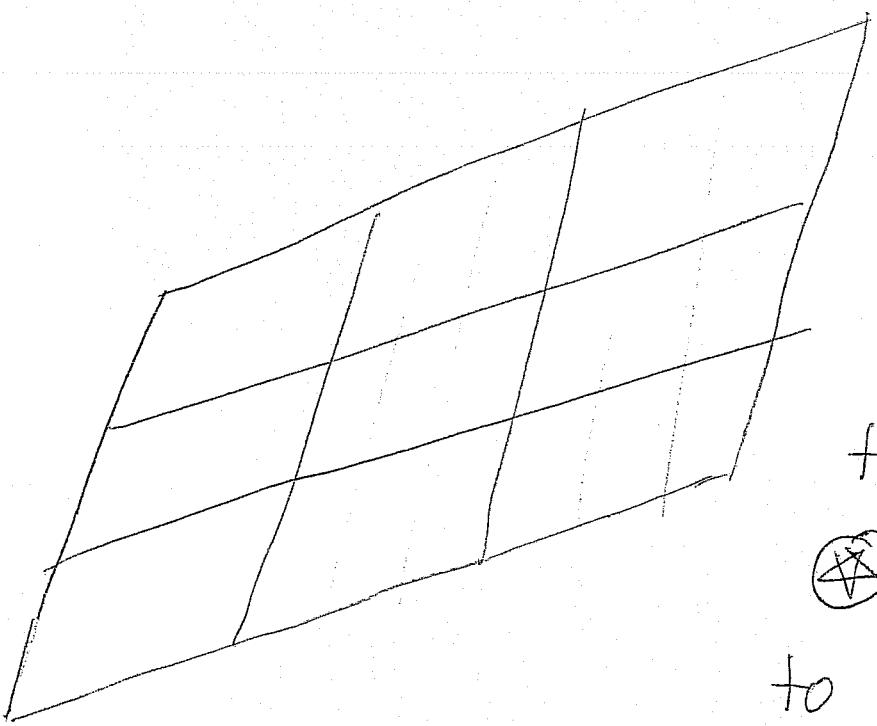
I (Existence) ...

II (Uniqueness) ...

The connection ... Sudoku is a giant graph

what are verts?

What are edges?



Put a vertex in each square.

The edges will "correspond" to the rules.

⛤ Connect a vertex to every other vertex that cannot have the same number. ⛤