San Francisco Math Circles – Sudoku

			6					5
				5		6		
	5			8				9
	2			1	6	7		
		1	7			9	6	
7	6			2				3
	9		3				2	7
	3	7		4				6
6			9		1	3		

	1							9
	5					7		
		7	3	8				1
			5		4			
5	4		1		3			
			4			1		
3	7		9	2		8	6	
8	6		1	4	5	3		

A *Sudoku square* is a 9×9 grid filled with nine symbols (such as the numbers from 1 to 9) in such a way that each row, column, and the nine 3×3 subsquares (shown above) contain each symbol exactly once. The two squares above contain some entries (called *clues*), and your task is to complete the Sudoku squares. It turns out that there is only one way to complete each square. (Caveat: If you've never played a Sudoku puzzle, watch out—these squares are addictive.) We will work on two problems regarding Sudoku squares:

(1) How many Sudoku squares are there?

(2) What is the minimum number of clues that yield a unique solution to a Sudoku puzzle?

These are hard questions. In fact, (1) was answered only last year, and (2) remains open. So we will simplify the problems and work with 4×4 Sudoku squares.