BOISE STATE MATH CIRCLE
Latin Squares – What Do Mathematicians Do?

The SUDOKU game was invented by American Howard Garns in 1979 and published by Dell Magazines as "Numbers in Place". In 1984, Maki Kaji of Japan published it in the magazine of his puzzle company Nikoli. He gave the game its modern name of Sudoku, which means "Single Numbers".

Task 1: Sudoku – Playing the Game

Solve SUDOKU A. Then use your solution of Sudoku A to solve Sudoku B.

SUDOKU A

1	2	3	4
3	4		
2		4	
4			2

SUDOKU B

1	2	3	4
3	4		
2		4	
4			3

Task 2

Solving 9x9 Sudoku!

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

Latin Squares - JUMPING IN THE RIVER

Imagine that you have a collection of n distinct symbols (for example, the first n letters of the alphabet assuming that n is smaller than 26). A *Latin Square* of size n is a $n \times n$ grid in which every row and column contains each of the n symbols exactly once.

Task 3: Latin Squares - Do they exist?

Task 4: Latin Squares - How many are there?

1		
2		
		2

1			
		4	
3			
			3

Do you know that there are 776,966,836,171,770,144,107,444,346,734,230,682,311,065,600,000 many Latin Squares of size n=11?

Task 5: Latin Squares - How to construct them efficiently?

1	2	3

1	2	3	4	5

1	2	3	4

1	2	3	4	5	6

Task 6: WHY THE DIFFERENCE?