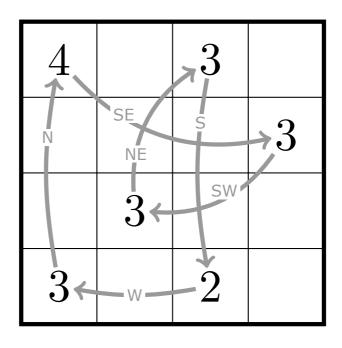
# Tricky logic puzzles



### Introduction

There are many puzzles where step-by-step logical deduction will get you to the solution easily. Think of (easy) Sudoku puzzles, for example. The challenge is to find out the next small step, filling in one number or ruling out a number in some cell, that will get you closer to the solution.

This booklet contains puzzles where the challenge is slightly different. These puzzles are made so that you have to think ahead a few steps, and by only taking small steps, you won't get to the solution.

You can make your life easier by coming up with a notation system that allows you to think ahead a few steps. See if you can come up with something clever.

Enjoy!

# **Puzzles**

1	Squares	1
2	Pointers	9
3	Signsweeper	17
4	Counting Borders	25
5	Flow	33

## 1 Squares

#### **Rules**

- Each cell is filled with a single digit (0−9).
- Each  $2 \times 2$  square of cells must sum to a particular number (indicated with  $\Box$ ).
- Each  $3 \times 3$  square of cells must sum to a particular number (indicated with  $\square$ ).
- No two rows may be identical.
- No two columns may be identical.

### **Example**

#### Puzzle:

	7		
		4	5
	5	3	
4			6

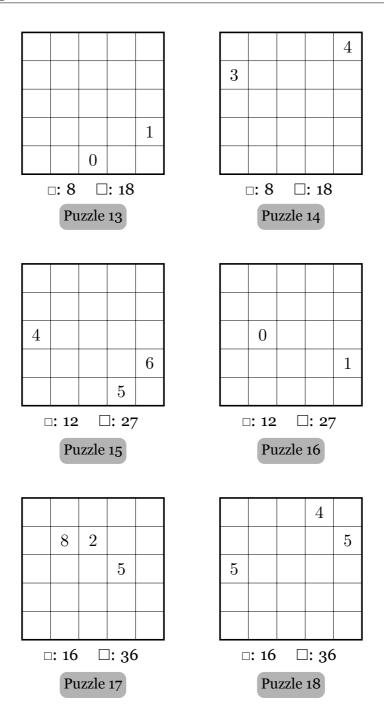
□: 12 □: 27

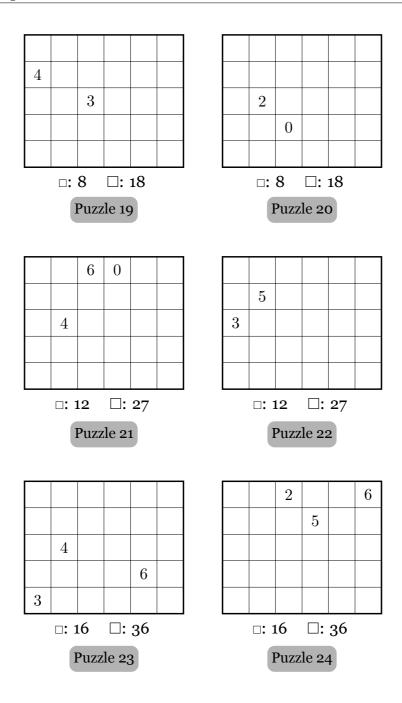
#### Solution:

0	7	1	2
5	0	4	5
2	5	3	0
4	1	3	6

		3			
0			4		
□: 8 □:	18		: 8	□; :	18
Puzzle :	1		Pu	ızzle 2	
2					
		3			
4		4			
3			3	3	
□: 12 □:	: 27		: 12	□:	27
Puzzle;	3		Pu	ızzle 4	
5				5	
1				0	
6				7	
□: 16 □:	: 36		: 16	□: ;	36
Puzzle g	5		Pı	ızzle 6	

2	4
	1
□: 8 □: 18	□: 8 □: 18
Puzzle 7	Puzzle 8
	1
2 4	2 3
□: 12 □: 27	□: 12 □: 27
Puzzle 9	Puzzle 10
	5
	2
2	
4 3	6
□: 16 □: 36	□: 16 □: 36
Puzzle 11	Puzzle 12





2     2     1     4       1     3     2     1       4     0     3     2       0     4     1     2	3     2     2     1       2     1     3     2       1     4     0     3       3     0     4     1	1     5     2     3       5     1     4     3       2     4     3     2       3     3     2     5
Solution 1	Solution 2	Solution 3
2     5     1     4       3     2     4     3       4     3     3     2       2     3     3     4	5     0     8     3       6     5     3     2       1     4     4     7       5     6     2     3	8     0     7     2       4     4     5     2       1     7     0     9       6     2     7     0
Solution 4	Solution 5	Solution 6
1     2     2     3     0     4       2     3     1     2     3     1	1 3 2 1 3 2 4 0 3 2 2 1	5 2 3 3 4 1 2 3 4 2 3 4
3 0 4 1 2 2	0 4 1 2 2 3	3 4 1 5 2 3
1 4 0 3 2 2	3 1 2 3 1 2	3 2 5 1 4 3
Solution 7	Solution 8	Solution 9
1 4 2 5 0 6	3 4 5 3 4 5	8 0 5 6 2 3
3 4 2 3 4 2	6 3 4 4 5 2	0 8 3 2 6 5
5         0         6         1         4         2           1         6         0         5         2         4	2     5     4     4     3     6       5     4     3     5     4     3	7 1 4 7 1 4 2 6 5 0 8 3
Solution 10	Solution 11	Solution 12

		_										_				_	
2	3	1	2	3		2	2	3	0	4		6	0	4		4	2
1	2	2	3	0		3	1	2	3	1		1	5	3		1	5
3	2	2	1	4		0	4	1	2	2		4	2	2	:	6	0
2	1	3	2	1		4	0	3	2	2		2	4	4		0	6
1	4	0	3	2		1	3	2	1	3		5	1	3	;	5	1
					,						l			_	_		
	Sol	lutio	n 13				So	lutio	n 14				So	luti	ion	15	
									Т								
2	5	0	6	1	1	6	1	5	6	1	1	4	2	6	. T	4	2
$\frac{1}{1}$	4	3	3	2		1	8	2	3	6		3	7	1	+	5	5
$\frac{1}{7}$	+-	5	1	6		7	Ť	6		2		F	1	7	+	3	3
<u> </u>	0	<u> </u>					7	3	5	7		5	-	+ -	+	_	6
0	5	2	4	1		2	<u> </u>	-	2			4	6	2	+	4	
3	4	1	5	2		5	2	4	7	0		3	3	5	'	5	1
	Sol	lutio	n 16		Solution 17						Solution 18						
0	3	2 2	_	4		0	3	2 2	_	4		2	2	6	0	4	4
4	1	2 2	3	0		4	1	2 2	2 3	0		5	3	1	5	3	1
4	$\rightarrow$	2 2 3 1	2 3	0		4	_	2 2 3	2 3	0		-	3	1 4	5	3	1 6
4	1 2	2 2	2 3	0		4	1 2	2 2 3	2 3	0		5	3	1	5	3	1
1 2	1 2 3 1	2 2 3 1 0 4 4 (	2 3 2 4 1 3 3	0 3 2 2		4 1 2	1 2 3	2 2 3 1 0 4	2 3	0 3 2		5 0 6	3 4 2	1 4 2	5 2 4	3 2 4	1 6 0
1 2	1 2 3 1	2 2 3 1 0 4	2 3 2 4 1 3 3	0 3 2 2		4 1 2	1 2 3 1	2 2 3 1 0 4 4 0	2 3	0 3 2 2		5 0 6	3 4 2 3	1 4 2	5 2 4 1	3 2 4 3	1 6 0
1 2	1 2 3 1	2 2 3 1 0 4 4 (	2 3 2 4 1 3 3	0 3 2 2		4 1 2	1 2 3 1	2 2 3 1 0 4 4 0	2 3 1 2 4 1 0 3	0 3 2 2		5 0 6	3 4 2 3	1 4 2 5	5 2 4 1	3 2 4 3	1 6 0
1 2	1 2 3 1	2 2 3 1 0 4 4 (	2 3 2 4 1 3 3	0 3 2 2		4 1 2	1 2 3 1	2 2 3 1 0 4 4 0	2 3 1 2 4 1 0 3	0 3 2 2		5 0 6	3 4 2 3	1 4 2 5	5 2 4 1	3 2 4 3	1 6 0
4 1 2 2	1 2 3 1 1 Sol	2 2 3 1 0 4 4 0 dutio	2 3 2 1 1 0 3 n 19	0 3 2 2 2		4 1 2 2	1 2 3 1 1 Sol	2 2 3 1 0 4 4 0 utio	2 3 1 2 1 1 0 3 n 20	0 3 2 2 2		5 0 6 1	3 4 2 3 Soo	1 4 2 5 5 lluti	5 2 4 1 ion	3 2 4 3 21 3	1 6 0 5
4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 1 0 4 4 (Columbia) 2 5 2 1 4	2 3 2 4 1 3 3 m 19	0 3 2 2 2		4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 1 0 4 4 (0 tutio	2 3 1 2 4 1 3 3 n 20	0 3 2 2 2		5 0 6 1	3 4 2 3 So	1 4 2 5 5 lluti	5 2 4 1 ion 5 5	3 2 4 3 3 3	1 6 0 5
4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 1 1 0 4 4 (Compared to the compared to t	2 3 2 1 1 1 1 3 3 1 1 3 3 3 2 2 3 3 3 2 2 3 3 3 3	0 3 2 2 2		4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 1 1 0 4 4 ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	2 3 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 2 2 3 1 1 1 2 3 1 1 1 2 3 1 1 1 1	0 3 2 2 2		5 0 6 1	3 4 2 3 Soo Soo Soo 3 3	1 4 2 5 5 Solution 2 4 6	5 2 4 1 5 5 1	3 2 4 3 21 21	1 6 0 5
4 1 2 2 2 3 4	1 2 3 1 1 Sol	2 2 2 3 1 1 0 4 4 (C	2 3 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 3 2 2 2		4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 11 10 44 (Cution 5 3 5 3 5 7 11	22 3 1 2 2 14 1 1 10) 3 3 6 5 2 5 4 1 6	0 3 2 2 2		5 0 6 1 5 5 3	3 4 2 3 3 Soo 5 5	1 4 2 5 5 Solution 2 4 6 2	5 2 4 1 ion 5 5 1 7	3 2 4 3 21 21	1 6 0 5
4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 1 1 0 4 4 (Compared to the compared to t	2 3 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 3 2 2 2		4 1 2 2 2	1 2 3 1 1 Sol	2 2 3 1 1 0 4 4 ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	22 3 1 2 2 14 1 1 10) 3 3 6 5 2 5 4 1 6	0 3 2 2 2		5 0 6 1	3 4 2 3 Soo Soo Soo 3 3	1 4 2 5 5 Solution 2 4 6	5 2 4 1 5 5 1	3 2 4 3 21 21	1 6 0 5
4 1 2 2 2 3 4	1 2 3 1 1 Sold	2 2 2 3 1 1 0 4 4 (Compared to the compared to	2 3 2 1 1 1 1 3 3 1 3 3 2 5 5 1 1 1	0 3 2 2 2 2 3 3 4 1 5		4 1 2 2 2	1 2 3 1 1 Sol 4 4 2 6 6	2 2 3 1 1 0 4 4 (Cutio	22 3 1 2 2 14 1 1 10) 3 3 6 5 2 5 4 1 6	0 3 2 2 2 1 7 3 3 5		5 0 6 1 5 5 3	3 4 2 3 Soo 5 5 5	1 4 2 5 5 Solution 2 4 6 2	5 2 4 1 5 5 1 7 3	3 2 4 3 3 7 1 5	1 6 0 5

### 2 Pointers

#### Rules

- Each cell is filled with a 2, 3 or 4 or remains empty.
- The number of non-empty cells is given ("#").
- Non-empty cells are not (horizontally or vertically) adjacent.
- Each non-empty cell points to another non-empty cell, forming a single cycle.
  - An arrow from a cell with value n points to a cell that is n (horizontal/vertical) steps away.
- The arrows in the cycle all get a label based on their compass direction (N, NE, E, SE, S, SW, W, NW).
  - For example, a diagonal arrow from the bottom left to the top right gets label NE, and a vertical arrow going up gets label N.
- Subsequent arrows may not have the same label.
- An arrow may not go from a 2 to a 4, or vice versa.

#### **Example**

	Puz	zle:	
4		3	
3			
	#:	6	

Solution:



(We will omit arrows.)

				_				
			4					
2			3		3			
						4		4
	#:	6		ı		#:	6	
F	uzz	le 25				Puzz	le 26	
		4						
	3					4		
					$\frac{1}{4}$			
	#:	6		l		#:	6	
F	uzz	le 27				Puzz	le 28	
					,			
			3			4		
					3			
	3		4					3
	#:	6		I		#:	6	
F	uzz	le 29				Puzz	le 30	

				2								4
			3				4					
	4				4				4			
3				4				3		2		
		#:	9						#:	9		
		Puzz	le 31						Puzz	le 32	2	
			4				3			2		3
2												
		2							4			
		#:	9			ı			#:	8	l	
			le 33	3			#: 8 Puzzle 34					
							2					
	4		2					2				
	4						4					
					3		4					
		#:	0		<u> </u>				#:	Q		
			9 :le 35							le 36		
		ı uzz	16 35	•					ı uzz	10 30		

3
#: 9 #: 8 Puzzle 37 Puzzle 38  #: 8 Puzzle 39 #: 8 Puzzle 40
#: 9 #: 8 Puzzle 37 Puzzle 38  #: 8 Puzzle 38  #: 8 Puzzle 39 #: 8 Puzzle 40
#: 9 #: 8 Puzzle 37 Puzzle 38  #: 8 Puzzle 39 #: 8 Puzzle 40  #: 8 Puzzle 40
#: 9 Puzzle 37 Puzzle 38  Puzzle 38  #: 8 Puzzle 39 #: 8 Puzzle 40
Puzzle 37  Puzzle 38  Puzzle 38  4 3  4 3  2 2  2 2  3 3  #: 8  Puzzle 39  Puzzle 40
3
4 3 4 3 2 2 2 2 2 2 3 3 3 4: 8 Puzzle 39 Puzzle 40
4 3 4 3 2 2 2 2 2 2 3 3 3 4: 8 Puzzle 39 Puzzle 40
2 2 2 3 3 3 #: 8 Puzzle 39 Puzzle 40
#: 8 #: 8 Puzzle 39 Puzzle 40
#: 8 #: 8 Puzzle 39 Puzzle 40
#: 8 #: 8 Puzzle 39 Puzzle 40
Puzzle 39  Puzzle 40
Puzzle 39 Puzzle 40
4 3 4
3
#: 8 #: 9

	2		4							2	
3		2				4		4			
			3		4						
								3			
		2		3						2	
#: 11 #: 11											
Puzzle 43											
	2		4				2		4		
3		2				3		2			
			3		4				3		
		2		3				2		3	
		#:	11					#:	11		
	]	Puzz	le 4	5			]	Puzz	le 46	5	
	2		4				2		4		
3		2				3		2			
			3		4				3		
		2		3				2		3	
		#:	11					#:	11		
	]	Puzz	le 47	7			I	Puzz	le 48	3	

3 4 2 3 3 Solution 25	3 3 3 3 4 4 4 Solution 26	3 4 4 3 3 3 Solution 27
3 3 3 4 4 4 3 Solution 28	2   3   3   3   3   4	4   4   3   3   3   3   Solution 30
3 2 2 3 4 3 4 Solution 31	4 3 4 4 3 3 4 4 3 3 2 3 Solution 32	2 4 3 3 3 3 2 2 2 Solution 33
3	3 2 3 4 2 3 3 3 3 3	2 3 3 3 2 2 2 4 3 3 Solution 36

										_							
2			3		2			3									3
	2			2			2		2				4			3	
3			2		3			3			Γ						
		3				4						2		2	2		2
4				3					3				3			3	
	Sol	utio	n 37			Sol	utio	n 38		•			Sol	luti	ion	39	
				3					3	]			3				3
	4		3			4		3				3				4	
														4	Į.		2
2		2		2	2		2		2				3				
	3		3			3		3			r	3			T	3	
	Sol	utio	n 40			Sol	utio	n 41					Sol	luti	ion	۱42	
	Sol	utio	n 40			Sol	utio	n 41					Sol	luti	ion	1 42	
	2	4	:			3		n 41					Sol 2		ion 4		
3	2	2	2		4	3	utio	2	3			3		2	4	2	
3	2	4	2	4	4	3 2	4		3			3	2				4
3 2	2	2	2		4	3 2		2			-	3 2			4		
	3	2 3	2	4	4	3 2 4	4	3 2	3 2				3	2 2	3	2	4
	3	2 3	3 3 m 43	4	4	3 2 4	3	2 3 2	3 2				3	2 2	3	3	4
	3 Sol-	4 4 2 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4	3 3 3 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4	4	3	3 2 4 Sol	33 uutio	2 3 3 2 2 2 m 44	3 2				2 3 3 Sol	2 2	3 3	3	4
2	3 Sol	4   22   3   3   22   4	3 3 3 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4	4		3 2 4 Sol	4 3 3 uutio	2 3 3 2 2 2 m 44	3 2			2	2 3 Sol	2 2	3 3	3	4
2	3 Sol-	4 4 2 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4	3 3 3 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4	4		3 2 4 Sol	33 uutio	2 3 3 2 2 2 m 44	3 2			2	2 3 3 Sol	2 2	3 3	3	4

# 3 Signsweeper

#### Rules

- Each cell is filled either with a zero, with a positive or negative number, with a positive mine (+), or with a negative mine (-).
- If a cell is filled with a number, this number should be the total number of (horizontally, vertically or diagonally) adjacent positive mines, minus the total number of (horizontally, vertically or diagonally) adjacent negative mines.
- Positive mines may not be diagonally adjacent to each other. Similarly for negative mines.
- A positive mine and a negative mine may not be horizontally or vertically adjacent to each other.
- The difference between the total number of positive mines and the total number of negative mines (or vice versa, if there are more negative mines) must be a particular number (indicated with  $\Delta$ ).

### **Example**

Puzzle:							
	-1						
			1				
	2						
	Δ	: 1					

Solution:

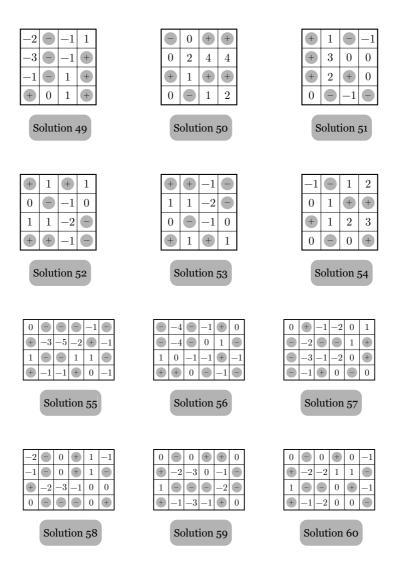
	-1	0	
	0	+	1
0	2	+	1
+	2	0	

-1 1	2 4		
-1	1		
Δ: 1	$\Delta$ : 3		
Puzzle 49	Puzzle 50		
$oxed{1}$			
3			
	1  -2		
-1	-1		
Δ: 1	Δ: 1		
Puzzle 51 Puzzle 52			
	-1		
1  -2			
	1 2 3		
1 1			
Δ: 1	Δ: 2		
Puzzle 53	Puzzle 54		

	-4
-5 $-2$ $-1$	
	1 -1 -1 -1
$\Delta$ : 3	$\Delta$ : 3
Puzzle 55	Puzzle 56
$egin{array}{ c c c c c c c c c c c c c c c c c c c$	-2 1 $-1$
$\begin{vmatrix} -3 & -1 & -2 \end{vmatrix}$	$\begin{vmatrix} -3 & -1 \end{vmatrix}$
Δ: 2	Δ: 2
Puzzle 57	Puzzle 58
	-1
$\begin{vmatrix} -2 & -3 &   -1 \end{vmatrix}$	$\begin{vmatrix} -2 & 1 \end{vmatrix}$
-2	-1
-1 -3	-1 $-2$
Δ: 1	Δ: 1
Puzzle 59	Puzzle 60

	-1 $-1$	
-3	2	
-2 $-5$	-4 $-2$	
-1	-3	
Δ: 3	Δ: 3	
Puzzle 61	Puzzle 62	
		1
1 -1	-2	_
1		
$-1 \ 1 \ -1$		
Δ: 2	Δ: 2	
Puzzle 63	Puzzle 64	
1		
$\begin{vmatrix} 1 \\ -1 \end{vmatrix}$ 3		
		-1
		-1 -1
	1 1	Т
Δ: 1	Δ: 1	
Puzzle 65	Puzzle 66	
1 uzzie 05	T UZZIC UU	

$\begin{vmatrix} -2 \end{vmatrix} \qquad \begin{vmatrix} -1 \end{vmatrix}$					
1					
-1 1					
4					
3 1					
Δ: 3					
Puzzle 68					
-1					
Δ: 2					
Puzzle 70					
-1					
1 2 5					
1 3 1					
Δ: 1					
$\Delta$ : 1 Puzzle 71 Puzzle 72					



# Signsweeper – solutions

+ 3 + 1 -1 0 2 + 0 = -1 0 -3 = 0 -2 = -5 = + -1 = -4 =	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	+     1     -     0       +     1     -2     -1     +       0     1     1     1     0       -     -1     +     -1     -1       -     -1     1     -1     -1   Solution 63
Solution of	Solution 02	Bolation 03
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Solution 64	Solution 65	Solution 66
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccc} -1 & -3 & \bigcirc & 0 & \oplus & 2 \\ \hline \bigcirc & -2 & \bigcirc & 0 & \oplus & 1 \end{array} $
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
+ 4 + 5 + 1	2 + 4 + 2 +	1 0 -2 0
+     4     +     5     +     1       1     3     +     4     +     2	2 + 4 + 2 + 2 + 4 + 3 1	1 0 0 -2 0 0 + -1 0 -1 +

# 4 Counting Borders

#### **Rules**

- Each cell is filled with a single number (1–5).
- Not all numbers have to be used in the puzzle, but whenever a number is used, all smaller numbers must also be used.
- For each two different numbers that are used, the total number of times that these numbers are directly adjacent to each other (horizontally or vertically) must be exactly a particular number (indicated by #).
- Diagonally adjacent cells may not contain the same number.
- A number may not appear in three cells in a row (horizontally or vertically).

#### **Example**

Pu	<b>zz</b> ]	e	•

4	2	1	1
	3		
		4	

#: 3

Solution:

1	3	3	2
4	2	1	1
4	3	4	2
1	3	4	2

		3					2			
					4					
	2	4	4				1			
				2						
	#:	3			#:	3				
	Puzz	le 73			Puzz	le 74				
		1				5	1			
	2				1	2	1			
						4				
1			3							
	#:	3			#:	2				
	Puzz	le 75		Puzzle 76						
5	1			3	4					
4	3				1					
						4				
	1		2	2		2				
	#:	2			#:	2				
	Puzz	le 77			Puzz	le 78				

		3					1		1			
2				1	3			4				
2	1				3		1		1			
			3		2			3			1	3
		#:	5						#:	5		
		Puzz	le 79						Puzz	le 8c		
2	3						1		4		1	
			4		1				2			
			3		3				3	1	4	
4		2					3	1	2			
	•	#:	5		•				#:	3		
		Puzz	le 81	L					Puzz	le 82		
		3	2		2		1	3				2
							4	4				5
	3		2	3			3				2	
4	2			1							3	1
		#:	3			•			#:	3		
Puzzle 83									Puzz	le 84		

					_					
1						1				
3							2			
1							1			
2							3	3		
		3	1	4		2				2
	=	#: 6		ı	•		:	#: 6		
	Pu	zzle	85				Pu	zzle	86	
				2			3	1		
3				3						2
	1		2	4			2			4
		3							3	3
		1								
	=	#: 6			•	•	:	#: 5		
	Pu	zzle	87				Pu	zzle	88	
1						1		1		
3			1			2				1
			1							
1		2								
			3			1	1		3	
	=	#: 5			-		:	#: 5		
	Pu	zzle	89				Pu	zzle	90	

1	1			2	3		3		3	1		
					4			2	2			
2	1		2	2			3					2
3								2	2			
			1								1	
		#:	7			-			#:	7		
		Puzz	le 91	1				]	Puzz	le 92	2	
	2					]			2	3		3
		1			1	-			1		1	
3	2	2		3	2		3	4		3		
						-						
	1				1	-						
		#:	7			J			#:	6		
			le 93	3				1	Puzz		1	
			).							)		
					1	1						
					1			0		1		1
					4			2		1	0	1
			0		4					0	2	1
	4	1	2		4			0		3		3
1	4	1	1		1	]		3	.,			
	#: 6								#:			
Puzzle 95							1	Puzz	le 96	5		

4     1     3     2       3     1     3     2	2     2     3     2       1     4     4     2	$ \begin{array}{c ccccc} 1 & 3 & 1 & 2 \\ 4 & 2 & 1 & 2 \end{array} $
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1     3     1     1       2     2     4     3	4     2     4     3       1     3     4     3
Solution 73	Solution 74	Solution 75
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	5     1     2     2       4     3     5     3       2     1     4     3       5     1     4     2	3     4     4     2       5     1     5     5       2     1     4     3       2     3     2     1
Solution 76	Solution 77	Solution 78
4     4     3     2     4     2       2     1     3     1     1     3       2     1     4     2     4     3       3     3     4     3     1     2	1     2     1     4     4     3       4     4     3     3     2     2       1     2     1     4     4     3       1     3     3     2     1     3	2     3     1     3     2     2       4     3     4     4     1     1       1     1     2     3     2     3       4     4     2     4     2     1
Solution 79	Solution 80	Solution 81
1     3     4     4     1     1       4     5     2     5     5     2       3     5     3     1     4     2       3     1     2     2     4     3	5     3     3     2     1     2       1     1     4     4     5     5       4     3     5     2     3     4       4     2     5     1     1     4	1     3     3     5     1     2       4     4     2     5     4     5       3     3     2     1     2     5       5     5     4     1     3     1
Solution 82	Solution 83	Solution 84

## $Counting\ Borders-solutions$

1	2	4	3	4	]	1	4	1	2	1		1	4	3	4	2	
3	2	1	2	1		3	2	3	3	4		3	2	3	1	3	
1	4	3	4	4		4	1	4	2	4		3	1	4	2	4	
2	4	2	2	3		4	3	3	1	3		4	2	3	3	1	
3	1	3	1	4		2	1	2	4	2		1	2	1	2	4	
9	1	9	1	4	J		1		4			1		1		4	
	Sol	utio	n 85				Sol	utio	n 86				Sol	utio	n 87		
-	0	-1			1			0	4	0	l			-		-1	
1	3	1	3	2		1	2	3	4	3		1	4	1	3	1	
4	4	1	3	2		3	2	3	1	2		2	2	1	3	1	
1	2	2	4	4		1	4	4	1	2		3	3	4	4	2	
4	4	1	3	3		1	2	2	3	4		4	2	2	3	2	
3	2	1	2	2		4	4	1	3	4		1	1	4	3	1	
	Sol	utio	n 88				Sol	utio	n 89				Sol	utio	n 90		
1	_	2 4	+	3		3	_	3 1	+	2		1	_	1 3	_	3	
2	-	$ \begin{array}{c c} 3 & 3 \\ \hline 1 & 2 \end{array} $	_	3		3	_	2 4	_	2		3	_	$ \begin{array}{c c} 1 & 4 \\ \hline 2 & 4 \end{array} $	_	1 2	
3	_	$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$		1		1	_	2 4	_	3		4		$\frac{2}{3}$ $\frac{4}{1}$	_	4	
1	-	3 1	+	3		4	-	1 4	+	2		3		2 4	_	1	
	Sol	utio	n 91				Sol	utio	n 92				Sol	utio	n 93		
1	2	2 3	1	3		4	3	3 2	1	1		4	2	3 2	2	1	
1	_	1 4	_	3		4	_	1 2	+	4		1		3 1	_	4	
3	_	1 3	-	2		3	_	1 3		2		1		4 2	_	1	
3	_	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	_	3		1	-+	2 2	+	1		2	-	1 3	_	3	
<u>+</u>		utio		_		1		utio		_		2   3   1   3   4   3   Solution 96					

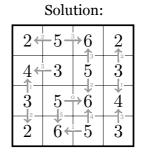
### 5 Flow

#### Rules

- Each cell is filled with a number between 1 and 6.
- (Horizontally or vertically) adjacent cells may not get the same number.
- Two cells that are a knight's move away from each other may not get the same number.
- There is *flow* from cells with an odd number to (horizontally or vertically) neighboring cells with an even number, so that:
  - The total amount of flow leaving a cell with an odd number adds up to the number in the cell.
  - The total amount of flow entering a cell with an even number adds up to the number in the cell.
  - The flow from any cell to any of its neighbors is an integer between 0 and 4.

### **Example**

Puzzle:											
	5		2								
4		5									
2	6		3								



				_				
						1		
1	3		6			4		
					5			
	Puzz	de 97	7	•		Puzz	zle 98	3
	2					3		
								5
							4	
1		4						
	Puzz	de 99				Puzz	le 10	0
5								
					4			
	6							6
		5			5			
	Puzz	le 10	1			Puzz	le 10:	2

				5	2								
		3		2						3		6	
			1		6		3			4	1		
					3					1			
Puzzle 103 Puzzle 104													
	5						2						
			1		4				1		4		
		3	6	5						1	3		
										2	5		
	I	Puzzl	e 10	5				F	Puzzl	e 100	6		
			6					4		2		2	
					1						4		
6	5			4					1			1	
		1								6			
	F	Puzzl	e 10	7				F	Puzzl	e 10	8		

					_					
						2			5	4
		4	3				3			
				6		2				
	6	2				1				
1	2	1				2			3	
Puzzle 109 Puzzle 110										
				2				4		
				4			4	3	4	
							1		1	
	2	1	6							
	1	2							6	
	Pu	ızzle	111				Pu	zzle	112	
	5									4
	6	1	4					1		
				5			6		2	
			5				5	1		
	Pu	zzle	113				Pu	zzle	114	

								2		1		
		2	4								1	
6	1		2	1								4
3							2					
							3	6				5
Puzzle 115  Puzzle 116												
5		4	5				6			2		
			1		1				2	1		
				1								5
											6	
		2							3	1		
		Puzz	le 11	-7					Puzz	le 11	8	
4		6							4	1		1
	3	1		1						5		
4					1							
											3	2
										5		1
	1	Puzz	le 11	0		-		I	Puzz	le 12	20	

## **Solutions**

$\begin{array}{ c c c c c } \hline 2 & 1 & 2 & 5 \\ \hline \end{array}$		2 1	2	3		1	2	1	3	
1 3 4 6		3 4	. 3	2	1	5	6	5	6	
5 4 3 5		5 6	5 5	6		6	5	6	5	
2 3 4 2		_		-		-	+	4	1	
	L	2 0	0	0	J	L	1.0	4	1	
Solution 97		Solu	ition	98			Solut	ion (	99	
2 3 4 2	Γ	5 4	5	2	]	5	2	5	2	
5 4 3 5		2 3	6	3		4	1	4	5	
1 3 4 6		3 6	3	1	:	6	3	1	6	
	-	_	5 6 5 6 5 1 3 Solution 101  Solution 101  Solution 101  Solution 104  Solution 104  Solution 104  Solution 104  Solution 104  Solution 104					4	5	
Solution 100			Solution 102							
2 6 5 2 5	2	5 6	5 5	6	5	6 5	3 2	5	3	
3 5 3 4 2	3 4	6 5	5 3	-				6	4	
2 6 5 1 5	6 3	-	-	_	<b>—</b>	_	_	_	3	
3 2 6 5 6	3 1	6 5	5 1	2   3	3	2   3	2   5	6	2	
Solution 103		Solu	tion	104		So	lutior	105	5	
2 4 5 4 2	5 3	+-		_			_	-	2	
3 5 1 3 4	6 2			_	_			_	3	
2     4     2     1     3       3     2     1     2     5	5 6 6 5	+-	_	_	_		_	_	2	
3 2 1 2 5	0	4	1 4	ə   4	#	9 0	9   6	9	2	
Solution 106										

					_						_						
6	5	2	4	3		2	5	6	5	4		1	5	6		5	2
5	1	4	3	1		1	3	1	2	5		4	6	4	Ī	3	4
6	5	3	5	6	1	2	4	2	1	2		3	5	3	Ť	1	3
5	6	2	6	5	1	1	5	4	2	3	-	5	2	1	t	6	4
1	2	1	5	4	-	2	3	2	3	2		4	1	2		5	3
	_			_	J		_	_			J						
	Solı	ıtior	109	9			Sol	utio	n 110				Sol	lutio	on	111	
	-	1	0	-	1	0	-	1		-	1		  -	Ι	_	-	
2	5	4	2	5		2	5	4	2	5	=	2	5	4	+	5	4
5	4	3	4	6		5	6	1	4	6		1	3	1	+	4	5
2	1	4	1	5		2	3	4	3	5		2	6	3	_	2	4
5	2	3	5	6		5	2	3	5	6		1	5	1	1	4	5
2	3	2	6	5		2	3	2	6	5	]	3	6	3		6	3
			n 112		ı				n 113					utio			
5	-	$\begin{vmatrix} 3 & 2 \\ 2 & 4 \end{vmatrix}$	_	4		3	4	_	1 2 3 1	5		6	2	3	5 1	6	3
6	-	4 2	_	5		3	5	_	1 3	4		5	3	4	3	1	2
3	_	5 3	_	4		2	3		2 1	2		6	5	3	5	6	5
2	5	4 5	4	5		3	6	4	5 6	5		5	6	2	6	5	2
	Sol	utio	n 115	5	•		Sol	utio	n 116	5			Sol	lutio	on	117	
6	5	3 2	6	3		4	5	6	5 3	6		1	3	4	1	3	1
5	4	2 1	. 5	4		2	3	1 -	4 1	3		2	5	6	5	6	2
3		4 5		5		4	2	-	5 4	1		4	3	4	1	2	1
2	$\rightarrow$	6 3	_	3		5	3		3 2	4		3	4	3	2	3	2
3	2	3 1	. 2	1		4	5	4	5 4	5		2	5	2	5	2	1
	Sol	utio	n 118	Solution 119 Solution 120													

# **Notes**

The puzzles in this booklet were designed using logic programming. Source code freely available at: https://github.com/rdehaan/puzzle-generator.

Ronald de Haan (me@ronalddehaan.eu)

Institute for Logic, Language and Computation (ILLC)
(https://www.illc.uva.nl/)

University of Amsterdam



Institute for Logic, Language and Computation