

# Killer Sudoku

Brian Conrey

11	10		16		8			15
		16	8	12		7	14	
27				8				14
		10		19	4			
	6				24			15
6	15	5			15			
		8	12		9	16	15	
16			9					
	18			9		8		

# Rules of Killer Sudoku

- It follows the rules of regular sudoku, AND
- The entries in the outlined (or shaded) blocks of cells must add up to the little number in the upper left-hand corner
- No numbers are repeated in a block of cells

<sup>11</sup> 3	<sup>10</sup> 4	6	<sup>16</sup> 7	9	<sup>8</sup> 1	2	5	<sup>15</sup> 8
2	1	<sup>16</sup> 9	<sup>8</sup> 5	<sup>12</sup> 4	8	<sup>7</sup> 3	<sup>14</sup> 6	7
<sup>27</sup> 8	5	7	3	<sup>8</sup> 2	6	4	1	<sup>14</sup> 9
4	9	<sup>10</sup> 8	2	<sup>19</sup> 6	<sup>4</sup> 3	1	7	5
6	<sup>6</sup> 3	2	1	5	<sup>24</sup> 7	8	9	<sup>15</sup> 4
<sup>6</sup> 5	<sup>15</sup> 7	<sup>5</sup> 1	4	8	<sup>15</sup> 9	6	2	3
1	2	<sup>8</sup> 5	<sup>12</sup> 9	3	<sup>9</sup> 4	<sup>16</sup> 7	<sup>15</sup> 8	6
<sup>16</sup> 7	6	3	<sup>9</sup> 8	1	5	9	4	2
9	<sup>18</sup> 8	4	6	<sup>9</sup> 7	2	<sup>8</sup> 5	3	1

## Number configurations for two cells

$$3=1+2 \text{ (unique)}$$

$$4=1+3 \text{ (unique)}$$

$$5=1+4=2+3$$

$$6=1+5=2+4$$

$$7=1+6=2+5=3+4$$

$$8=1+7=2+6=3+5$$

$$9=1+8=2+7=3+6=4+5$$

$$10=1+9=2+8=3+7=4+6$$

$$17=9+8 \text{ (unique)}$$

$$16=9+7 \text{ (unique)}$$

$$15=9+6=8+7$$

$$14=9+5=8+6$$

$$13=9+4=8+5=7+6$$

$$12=9+3=8+4=7+5$$

$$11=9+2=8+3=7+4=6+5$$

## Number configurations for three cells

$$6=1+2+3 \text{ (unique)}$$

$$7=1+2+4 \text{ (unique)}$$

$$8=1+2+5=1+3+4 \text{ (must have a 1)}$$

...

$$22=9+8+5=9+7+6 \text{ (must have a 9)}$$

$$23=9+8+6 \text{ (unique)}$$

$$24=9+8+7 \text{ (unique)}$$

## Number configurations for four cells

$$10=1+2+3+4 \text{ (unique)}$$

$$11=1+2+3+5 \text{ (unique)}$$

$$12=1+2+3+6=1+2+4+5 \text{ (must have a 1 and a 2)}$$

$$13=1+2+3+7=1+2+4+6=1+3+4+5 \text{ (must have a 1)}$$

$$30=9+8+7+6 \text{ (unique)}$$

$$29=9+8+7+5 \text{ (unique)}$$

$$28=9+8+7+4=9+8+6+5 \text{ (must have a 9 and an 8)}$$

$$27=9+8+7+3=9+8+6+4=9+7+6+5 \text{ (must have a 9)}$$

Fill in the  
green.

	3			4	

	3			4	

ANSWER. The green has 3  
on top, 1 on bottom.

REASON. The yellow is 1,2.  
The green is 1,3. The 3 must  
be on top in the green.

Fill in the  
brown.

17			16		

17			16		

ANSWER. The brown has 8 on top and 9 on the bottom. REASON: The green is 7,9 and the brown is 8,9. The 8 must be on top.

Fill in the  
blue.

		17			
					16

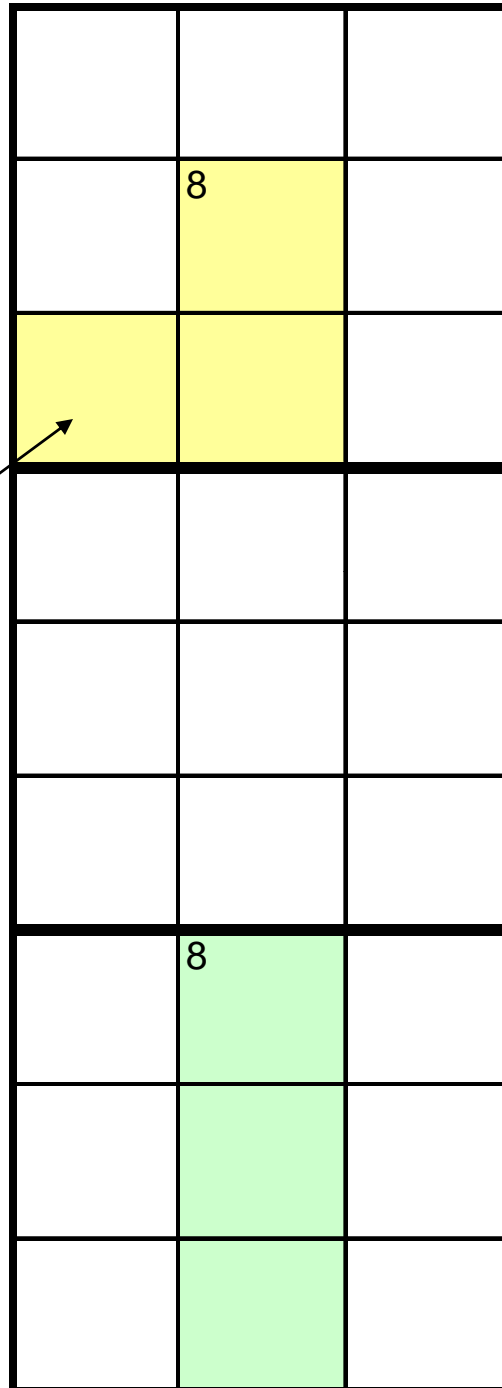
ANSWER. The blue is 9 on the left and 8 on the right. REASON. The green is 7,9. The blue is 8,9. So the blue 9 must be on the left.

		17			
					16

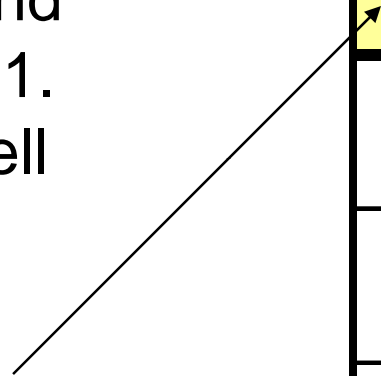




What  
number  
goes in  
the left-  
most  
yellow  
cell?



ANSWER. The leftmost yellow cell is a 1. REASON. Both the yellow and the green have a 1. Therefore, this cell is a 1.



	8	
	8	

		7
5		

What numbers  
go in the  
green?

		7
5		

ANSWER. The green cells are 3 on the top and 2 on the bottom.  
 REASON. The pink is 1,2,4. The green is either 1,4 or 2,3.  
 Therefore, it must be 2, 3 and the top green cell is 3.

	5			
	7 6	11 2	9	
	1			

Fill in the  
green  
cells.

	5			
	7 6	11 2	9	
	1			

ANSWER. The green cells are 4 on the left and 1 on the right.  
 REASON. The green can't be 2, 3 because there is already a 2. Therefore, it is 1,4 with the 4 on the left.

22		18			
7					

What number goes in this right-most green cell?

ANSWER. The right-most green cell is a 2.  
REASON. The sum of the numbers from 1 to 9 is 45. Since  $22+18+7=47=45+2$ , the rightmost green cell is 2.

22		18			
7					

What number goes in the top-most green cell?

6						7		



What numbers go in the yellow cells?

5						12		
	7		16				9	

ANSWER. 1 on top and 4 on bottom. REASON.  
 That's because  $7+16+9=32 = 45-13$  which means  
 that the bottom yellow cell plus the bottom pink cell  
 add up to 13. Now  $13=9+4=8+5=7+6$  and only the  
 4 is small enough to go into the yellow.

5						12		
	7		16				9	





					16
	17			13	

Fill in the  
green  
cells.

					16
	17			13	

ANSWER: The green cells are 7 on the left and 6 on the right.  
 REASON. The pink is 9,8. Therefore the green is 6,7. Since the yellow is 7,9, it must be the case that the left green cell is the 7 and the right is the 6.

16		3
7		
22		14

What number goes in this cell?



16		3
7		
22		14

ANSWER. This cell is a 9.  
 REASON. The green block is 7 and 9, and the brown block must contain a 9.

Fill in the blue  
cells.

	14		22	3		
		10				
				6		

ANSWER. The blue cells are 4 on the left and 2 on the right. REASON. The brown is 1,2. The 3 cannot go in the blue (because 3,3 is illegal) and cannot go in the green or yellow (too small). Therefore, the pink is 3,7. Therefore, the blue is 2,4. The right green cell and the left blue cell add up to 10 (because  $10+22+3=35$ ); this 10 must be 4,6. Therefore, the left blue cell is 4 and the right one is 2.

	14		22	3		
		10				
				6		

			18		
		23			
	13			4	

What number goes in this cell?

			18		
		23			
	13			4	

ANSWER. This cell is a 6. REASON. Since  $18+23+4=45$ , the leftmost blue cell and rightmost brown cell are equal. Since  $23=6+8+9$ , the answer is one of these numbers. But  $13=9+1+3=8+1+4=8+2+3$  can't work because of the yellow  $4=1+3$ . Therefore, it must be a 6.





Fill in the yellow and green cells.

							17	10
4		9		19				

ANSWER. We have  $x+y=13$ . Also  $x$  is 8 or 9. But  $x=8$  would imply  $y=5$  which is impossible. Therefore,  $x=9$  and  $y=4$ .

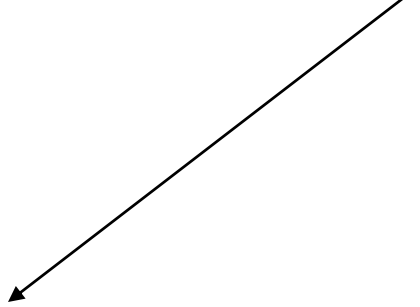
							17	10
4		9		19			X	y



SOLUTION. We have  $x+y=11$ . Also,  $x=1$  or  $2$ .  
Therefore,  $x=2$ .

15		3	12		6		20	
		X						y

Fill in the blue cells.



22		6	3					
	7			17		21		
		28						

SOLUTION.  $x+y+z=14$  and  $y+z$  is at most 7; the only possibilities for  $(x,y,z)$  are  $(9,4,1)$ ,  $(9,3,2)$ ,  $(8,5,1)$ ,  $(8,4,2)$ , and  $(7,4,2)$ . We can rule out each possibility except those with  $x=8$ . Then the blue cells are 8,9,5. The 9 is on the bottom.

22 x		6 y	3 z					
	7			17		21		
		28						

Fill in the  
blue cells.

		20
30		
		12
		16

SOLUTION. The yellow is 1,2,3,4,6. Therefore the blue is 5,7. So, the pink must be 9,8,1,2. The green is 6,7,8,9 with the 6,7 in the upper two cells. Therefore, the upper blue must be 5 and the lower 7.

		20
30		
		12
		16

What number goes in this blue corner cell?

35		8	
5			
9			
19			
12			

SOLUTION. We have  $x=3$ . Therefore, the other brown cells are 1 and 4. So, the yellow cells are 2 and 3. This means the only place 1 can go in the first column is z. Since  $y+z=9$ , it follows that  $y=8$ .

35	y		8	x
5				
9	z			
19				
12				



Solution.  
 $X+y=15$ .  
 $a+b+c=6$ .  
 The only  
 place for the  
 4 is next to  
 the x.  
 Therefore,  
 $x=6$ .

10 x		14	
15	19 a		
	b	12 c	
15			
y			

10		14	19			12		19
15	19			18	12			
		12					14	
4			15					

Fill in the blue cells.

10		14	19			12		19
15	19			18	12			
		12					14	
4			15					

SOLUTION: The sum of the first four rows must be  $4 \cdot 45 = 180$ . Do the addition mod 10.

Fill in the  
blue corner  
cell.

15			15			22		
28								
9								

**SOLUTION:**  
The three  
blue  
horizontal  
cells add to 8,  
as do the  
three blue  
vertical cells.  
Therefore, the  
corner cell  
must be a 1.

15			15			22		
28								
9								

Fill in the blue cells.

18		
3		
12		
16		
7		

# SOLUTION.

$x+y+z=23$ . So  
 $z=6,8$  or  $9$ . So  
 $z=9$ .

18 x		
y		
3		
12		
16 z		
7		

Fill in the  
blue cells.

11		
14		
	7	
18		
13		

### SOLUTION.

$x+y+z=20$  but  $x$  is 1, 2, or 4; therefore  $x=4$  and  $y$  and  $z$  are 7 and 9. Next,  $x+u+v=14$ , so  $u+v=10$ . It must be that  $u$  and  $v$  are 2 and 8. Therefore,  $u=2$  and  $w=1$ .

11		
14		
	7	
	w	
x	u	v
18		
y		
13		
z		

What number goes in this cell?

18	8	11	12		17			
			12					
	21							

What number goes in this cell?

18	8	11	12 5/7	5/7	17 8/9	8/9		
			12					
	21		4/9	4/9				

ANSWER: 9. The 17 is 8 and 9. Therefore, the 12 is 5 and 7. The left two pink cells add to  $45 - 18 - 8 - 11 = 8$ . The right two pink cells add to 13, which must be 9 and 4. Therefore, the left yellow cell in the 17 cannot be 9.

From 'The official book of killer sudoku' – puzzle 22, mild.

4		13	13		13	11		
11	10		3			9	16	
		12	4	16	10		17	4
17	10							
		4	10				9	13
5	16		10	12	16	6		
		14					4	6
12			17	3		16		
7				8			14	

12		6			13		14	
17	3	11		17	4		15	7
		12			6			
	15		9	8	4		7	19
11	12	5			16			
			15	10		17		
11		17		6			8	
4				13	10	9	16	
11		11					4	

A Will  
Shortz  
puzzle.

16	9	17		6	11	11	7	
		4					9	
10	6	1	15		4	18		
		12	8			13		12
10			20			13	6	
	15		11	11				12
12				14		2		
9		11	7	9	3		9	13
13					16			

A  
seven  
minute  
puzzle.

Daily No. 767

Moderate

9			17			19		
10	9		8		17		6	
	17		20		7	11		
16				18		4		22
5		14			5			
5		15			16	17		
11	10			13		10		
	12				5		12	
12			14			19		

	1	2	3	4	5	6	7	8	9
A	11	10		16		8			15
B			16	8	12		7	14	
C	27				8				14
D			10		19	4			
E		6				24			15
F	6	15	5			15			
G			8	12		9	16	15	
H	16			9					
I		18			9		8		

London  
Times,  
Killer  
Sudoku II,  
Puzzle 76,  
deadly, 46  
minutes.

The End