

Mesumo Sample Puzzles

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by Stefan Hollos and J. Richard Hollos

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The web page for the Mesumo puzzles book is
<https://www.abrazol.com/books/gamesv01/>

Rules of Mesumo

Mesumo is a grid completion puzzle that will exercise your basic arithmetic and logic skills. There are 600 puzzles in the book, with solutions in the back.

The goal of each puzzle is to arrange the numbers 1 through 9 in a three by three grid so that the row, column and diagonal sums match the given values. Each of the numbers 1 through 9 must be used once.

For each puzzle, three of the numbers in the grid are given and the positions of the odd numbers are shown as shaded squares. The remaining six numbers are to be determined.

Each arrangement of the numbers 1 through 9 in the three by three grid corresponds to a permutation of the numbers. By permutation we mean a particular linear ordering of the numbers. For example

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

is a permutation. The number of such permutations is

$$9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 362,880$$

This comes from the fact that there are 9 numbers that

can come first, 8 numbers that can come second, and so on. The solutions for the puzzles are shown as permutations in the back of the book.

Each row, column and diagonal is a way of choosing three numbers out of the set of numbers 1 through 9, and there are 84 ways of doing that, not counting the six different ways the three numbers can be ordered. The possible row, column and diagonal sums range from 6 to 24. There is only one way to get $6=1+2+3$ and there is only one way to get $24=7+8+9$. The possible row, column and diagonal sums are shown in the following table along with the numbers that produce those sums.

6	(1):	(1,2,3)						
7	(1):	(1,2,4)						
8	(2):	(1,2,5)	(1,3,4)					
9	(3):	(1,2,6)	(1,3,5)	(2,3,4)				
10	(4):	(1,2,7)	(1,3,6)	(1,4,5)	(2,3,5)			
11	(5):	(1,2,8)	(1,3,7)	(1,4,6)	(2,3,6)	(2,4,5)		
12	(7):	(1,2,9)	(1,3,8)	(1,4,7)	(1,5,6)	(2,3,7)		
		(2,4,6)	(3,4,5)					
13	(7):	(1,3,9)	(1,4,8)	(1,5,7)	(2,3,8)	(2,4,7)		
		(2,5,6)	(3,4,6)					

14	(8):	(1,4,9)	(1,5,8)	(1,6,7)	(2,3,9)	(2,4,8)	
		(2,5,7)	(3,4,7)	(3,5,6)			
15	(8):	(1,5,9)	(1,6,8)	(2,4,9)	(2,5,8)	(2,6,7)	
		(3,4,8)	(3,5,7)	(4,5,6)			
16	(8):	(1,6,9)	(1,7,8)	(2,5,9)	(2,6,8)	(3,4,9)	
		(3,5,8)	(3,6,7)	(4,5,7)			
17	(7):	(1,7,9)	(2,6,9)	(2,7,8)	(3,5,9)	(3,6,8)	
		(4,5,8)	(4,6,7)				
18	(7):	(1,8,9)	(2,7,9)	(3,6,9)	(3,7,8)	(4,5,9)	
		(4,6,8)	(5,6,7)				
19	(5):	(2,8,9)	(3,7,9)	(4,6,9)	(4,7,8)	(5,6,8)	
20	(4):	(3,8,9)	(4,7,9)	(5,6,9)	(5,7,8)		
21	(3):	(4,8,9)	(5,7,9)	(6,7,8)			
22	(2):	(5,8,9)	(6,7,9)				
23	(1):	(6,8,9)					
24	(1):	(7,8,9)					

The number in parentheses next to each sum is the number of ways to get that sum. So for the sum 9, there are three ways to get it: $1+2+6$, $1+3+5$, or $2+3+4$. This table may be useful for solving some of the puzzles. We'll leave it to you to figure out how.

Mesumo Sample Puzzles

1.

4			9
		5	12
	7		24

16	13	16	16	19
----	----	----	----	----

2.

6			17
		1	10
	9		18

19	18	16	11	12
----	----	----	----	----

3.

8			11
		6	22
	4		12

16	20	14	11	20
----	----	----	----	----

4.

7			13
		4	9
	6		23

13	18	14	13	18
----	----	----	----	----

5.

3			10
		8	24
	4		11

18	17	12	16	12
----	----	----	----	----

6.

6			19
		7	12
	2		14

12	13	8	24	16
----	----	---	----	----

7.

6			17
		2	16
	1		12

20	23	10	12	14
----	----	----	----	----

8.

3			6
		5	18
	8		21

17	13	18	14	19
----	----	----	----	----

9.

1			8
		9	19
	7		18

9	10	16	19	13
---	----	----	----	----

10.

1			9
		9	21
	3		15

17	10	12	23	16
----	----	----	----	----

11.

7			13
		4	12
	8		20

6	16	15	14	18
---	----	----	----	----

12.

4			9
		6	18
	8		18

18	18	18	9	12
----	----	----	---	----

13.

7			17
		8	20
	1		8

17	12	14	19	21
----	----	----	----	----

14.

7			14
		1	12
	4		19

19	19	17	9	21
----	----	----	---	----

15.

1			15
		6	21
	4		9

15	10	21	14	12
----	----	----	----	----

16.

2			17
		7	18
	1		10

21	9	15	21	15
----	---	----	----	----

17.

8			18
		2	12
	9		15

10	13	22	10	19
----	----	----	----	----

18.

7			18
		8	17
	4		10

17	18	9	18	11
----	----	---	----	----

19.

2			11
		4	18
	3		16

19	17	9	19	14
----	----	---	----	----

20.

9			18
		8	17
	4		10

18	17	12	16	16
----	----	----	----	----

21.

2			10
		5	17
	8		18

8	15	18	12	11
---	----	----	----	----

22.

8			21
		6	15
	3		9

16	20	9	16	11
----	----	---	----	----

23.

2			12
		8	17
	5		16

8	12	17	16	12
---	----	----	----	----

24.

3			11
		8	18
	4		16

8	17	11	17	11
---	----	----	----	----

Solutions

1. 4 3 2 1 6 5 8 7 9
2. 6 3 8 5 4 1 7 9 2
3. 8 1 2 7 9 6 5 4 3
4. 7 5 1 2 3 4 9 6 8
5. 3 1 6 9 7 8 5 4 2
6. 6 5 8 4 1 7 3 2 9
7. 6 4 7 9 5 2 8 1 3
8. 3 1 2 4 9 5 6 8 7
9. 1 5 2 6 4 9 3 7 8
10. 1 2 6 5 7 9 4 3 8
11. 7 5 1 6 2 4 3 8 9
12. 4 3 2 5 7 6 9 8 1
13. 7 4 6 3 9 8 2 1 5
14. 7 5 2 3 8 1 9 4 6
15. 1 9 5 7 8 6 2 4 3
16. 2 6 9 3 8 7 4 1 5
17. 8 7 3 4 6 2 1 9 5
18. 7 2 9 6 3 8 5 4 1
19. 2 1 8 9 5 4 6 3 7
20. 9 2 7 3 6 8 5 4 1
21. 2 7 1 9 3 5 4 8 6
22. 8 4 9 7 2 6 5 3 1
23. 2 9 1 6 3 8 4 5 7
24. 3 6 2 9 1 8 5 4 7