

Sudoku

In a 4×4 **Sudoku** puzzle, each empty square must be filled with a number so that every row and column contains each digit from 1 through 4. The grid is also broken into four 2×2 grids called boxes. Each box must contain every digit from 1 through 4.

EXAMPLE Solve the following Sudoku puzzle.

1			
	2		
			3
	4	1	

The lower-right box has a 1 and a 3, so we need to place a 2 and a 4 in the shaded squares. Since there is already a 4 in the bottom row, the 4 cannot be placed in the bottom-right square. So, we place the 2 in the bottom-right square and the 4 in the other shaded square.

1			
	2		
		4	3
	4	1	2

The bottom row is only missing a 3. So, we fill the bottom-left square with a 3.

1			
	2		
		4	3
3	4	1	2

The first column is missing a 4 and a 2. The second row already has a 2, so we place the 4 in the second row, and the 2 in the third row.

1			
4	2		
2		4	3
3	4	1	2

We use similar reasoning to fill the remaining squares in the grid as shown below.

1			
4	2		
2	1	4	3
3	4	1	2

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

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

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

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

PRACTICE Solve each 4×4 Sudoku puzzle below.

33.

1			
	4		
		2	
		1	3

34.

1		2	3
	3		4

35.

	3	2	
3			1

PRACTICE

Use the clues given in each Sudoku puzzle below to fill in the requested numbers.

- 36.** What number belongs in the shaded square in the Sudoku below?

1			
		4	
	3		
			2

- 37.** What number belongs in the shaded square in the Sudoku below?

			1
	3		
4		2	

- 38.** Three of the 2's appear in the Sudoku below. Fill in the final 2.

	2		
2			
		2	

- 39.** Two of the 3's appear in the Sudoku below. Fill in the remaining 3's.

		1	
			3
3			

- 40.** Two of the 3's appear in the Sudoku below. Fill in the remaining 3's

3			
			3

- 41.** Fill in the remaining 2's and 4's in the Sudoku below.

		4	2
		2	
	4		

- 42.** What number belongs in the shaded square in the Sudoku below?

			1
		2	
	3		4

- 43.** What number belongs in the shaded square in the Sudoku below?
★

			4
			2
1			

Every monster who lives on a small island belongs to one of two tribes. Monsters in the liar tribe *always* lie. Monsters in the truth-teller tribe *always* tell the truth. The only way to tell which monsters are liars and which are truth-tellers is by listening to statements made by monsters who live on the island.

EXAMPLE

Alex encounters two islanders and asks which tribe they belong to. Yorp says, "We are both truth-tellers," to which Mags replies, "Yorp is lying." Which tribe does each monster belong to?

We don't know yet whether Yorp is telling the truth or lying. We consider both possibilities:

If Yorp is telling the truth when he says, "We are both truth-tellers," then Mags is also a truth-teller. But, if Mags is telling the truth when she says that Yorp is lying, then Yorp is a liar. Yorp can't be both a liar and a truth-teller! This is called a **contradiction**. So, Yorp is not a truth-teller.

If Yorp is lying when he says, "We are both truth-tellers," then, since Mags says that Yorp is lying, Mags is a truth-teller. This works!

Only one of these two possibilities works. So, **Yorp is a liar and Mags is a truth-teller.**

PRACTICE

Use the information below to complete each statement and answer the questions that follow.

Alex is visiting the island of liars and truth-tellers. In line at the supermarket, Alex meets Bib and Loaf. Bib points to Loaf and says, "He's a liar." Loaf wraps his arm around Bib and says, "We're both liars!"

44. Case 1: Consider the possibility that Bib is telling the truth.

If Bib is telling the truth, then Loaf is a _____.
(liar/truth-teller)

45. Case 2: Consider the possibility that Bib is lying.

If Bib is lying, then Loaf is a _____.
(liar/truth-teller)

46. Which of the two cases above is impossible?

46. (circle one) Case 1 Case 2

47. Which tribe does each monster belong to?

47. Bib: _____

Loaf: _____

PRACTICE

Use the information below to complete each statement and answer the questions that follow.

Later in his visit, Alex meets Geoff, Huck, and Iggy. Geoff says, "Huck is a liar." Iggy says, "No, Huck is a truth-teller." Huck says to Alex, "One of them is lying, but the other is telling the truth." Which tribe does each monster belong to?



48. **Case 1:** Consider the possibility that Geoff is telling the truth.

If Geoff is telling the truth, then Iggy is a _____, and
(liar/truth-teller)
 Huck's statement is _____.
(true/false)

49. **Case 2:** Consider the possibility that Geoff is lying.

If Geoff is lying, then Iggy is a _____, and
(liar/truth-teller)
 Huck's statement is _____.
(true/false)

50. Which of the two cases above gives a **contradiction**?

50. (circle one) Case 1 Case 2

51. Which tribe does Huck belong to?

51. Huck: _____

52. Which tribe does Geoff belong to?

52. Geoff: _____

53. Which tribe does Iggy belong to?

53. Iggy: _____