

# Two Codebreaking Puzzles

12 October 2025

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6	4	2	7
6	0	8	9
9	5	0	2
1	4	9	0

<b>1:</b>	6	4	7	5	🐮
<b>2:</b>	5	1	3	0	🐮 🐮
<b>3:</b>	7	3	8	0	🐮 🐮
<b>4:</b>	0	6	3	2	🐮 🐮
<b>5:</b>	8	5	3	2	🐮 🐮
<b>6:</b>	1	7	3	2	🐮 🐮

**#1** Following Wordle-style rules, we have concealed a 4-digit code. A black square represents a digit in the right place, and a blue one represents the right digit but in the wrong place. What is the correct code?

**#2** Can you work out the secret 4-digit code from the clues above? A white cow icon represents a correct digit in the incorrect place, and a brown cow represents a correct digit in the correct place.

These code-breaking puzzles are from MathsJam Shout for October 2025.<sup>1</sup> The second one is reminiscent of the mesmerizing 1970s game Mastermind,<sup>2</sup> which consumed many hours of my time.

## Solution #1

There are three 0s, which are correct digits but in the wrong place. Therefore 0 must be the first digit. Similarly, there are three 9s, which are correct digits but in the wrong place. So 9 must be the second digit. 2 is already a correct digit in the correct place. All the other digits displayed are not correct digits. The only digit missing is 3, so it must be the last digit in the fourth place. Thus the 4-digit code is **0923**.

## Solution #2

I have replaced the cows with colored squares: orange for correct digit, green for correct location.

<b>R1</b>	6	4	7	5	🟡	🟡
<b>R2</b>	5	1	3	0	🟢	🟡
<b>R3</b>	7	3	8	0	🟡	🟡
<b>R4</b>	0	6	3	2	🟢	🟢
<b>R5</b>	8	5	3	2	🟢	🟢
<b>R6</b>	1	7	3	2	🟢	🟡

Code: \_ \_ \_ \_

<sup>1</sup> <https://mathsjam.com/shout/MJShout.pdf>

<sup>2</sup> Wikipedia: Mastermind was invented in 1970 by Mordecai Meierowitz, an Israeli postmaster and telecommunications expert. After presenting the idea to major toy companies and showing it at the Nuremberg International Toy Fair, it was picked up by a plastics company, Invicta Plastics, based near Leicester, UK. Invicta purchased all the rights to the game, and the founder, Edward Jones-Fenleigh, refined the game further. It was released in 1971–72. ([https://en.wikipedia.org/wiki/Mastermind\\_\(board\\_game\)](https://en.wikipedia.org/wiki/Mastermind_(board_game)))

Assume 3 is a digit. This satisfies all rows.

R1	6	4	7	5		
R2	5	1	3	0		
R3	7	3	8	0		
R4	0	6	3	2		
R5	8	5	3	2		
R6	1	7	3	2		

Code: \_ \_ 3 \_

0 1 2 3 4 5 6 7 8 9

The number 2 cannot be a digit, since it is not in the correct place in R6.

0 1 2 3 4 5 6 7 8 9

Assume 0 is a digit. This satisfies R2, R3, and R4.

R1	6	4	7	5		
R2	5	1	3	0		
R3	7	3	8	0		
R4	0	6	3	2		
R5	8	5	3	2		
R6	1	7	3	2		

Code: 0 \_ 3 \_

0 1 2 3 4 5 6 7 8 9

Then R2 and R3 imply 1, 5, 7, 8 cannot be digits, but that contradicts R5 and R6. Therefore 0 is not a digit.

0 1 2 3 4 5 6 7 8 9  
0 1 2 3 4 5 6 7 8 9

Therefore R4 and R1 imply 6 is a digit.

R1	6	4	7	5		
R2	5	1	3	0		
R3	7	3	8	0		
R4	0	6	3	2		
R5	8	5	3	2		
R6	1	7	3	2		

Code: \_ 6 3 \_

0 1 2 3 4 5 6 7 8 9

The number 5 is not a digit, since even though it would satisfy R2 and R5, it would contradict R1.

R1	6	4	7	5		
R2	5	1	3	0		
R3	7	3	8	0		
R4	0	6	3	2		
R5	8	5	3	2		
R6	1	7	3	2		

Code: \_ 6 3 \_

0 1 2 3 4 5 6 7 8 9

Therefore, by R5 8 is a digit. It also satisfies R3.

R1	6	4	7	5		
R2	5	1	3	0		
R3	7	3	8	0		
R4	0	6	3	2		
R5	8	5	3	2		
R6	1	7	3	2		

Code: 8 6 3 \_

0 1 2 3 4 5 6 7 8 9

Therefore, by R2 that leaves **1 is a digit**. This also satisfies R6.  
 Therefore 1 would have to be in the fourth place.

<b>R1</b>	6	4	7	5		
<b>R2</b>	5	1	3	0		
<b>R3</b>	7	3	8	0		
<b>R4</b>	0	6	3	2		
<b>R5</b>	8	5	3	2		
<b>R6</b>	1	7	3	2		

Code: 8 6 3 1

0 1 2 3 4 5 6 7 8 9

MathsJam did not provide answers, but hopefully I did not make a mistake in logic. There are certainly other paths of reasoning to arrive at the answer.

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