

CROSS NUMBER

Mr. Merrick · Logic Puzzles

How to solve: Fill the grid so that every listed Across and Down clue is satisfied. These clues are intended to work together, so crossings matter. All clues are mathematical.

Puzzle 1

2×2

| | |
|---|---|
| 1 | 2 |
| 3 | |

Across

1. A two-digit square.
3. A two-digit triangular number.

Down

1. A two-digit even number whose digits are consecutive in increasing order.
2. A multiple of 5.

Puzzle 2

3×3

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | | |
| 5 | | |

Across

1. A three-digit square divisible by 9.
4. A three-digit cube.
5. A three-digit square beginning with 5.

Down

1. A three-digit multiple of 35.
2. A three-digit prime.
3. A three-digit even number whose digits are consecutive in increasing order.

CROSS NUMBER

Solutions and Reasoning

Puzzle 1

| | |
|-------------------|-------------------|
| ¹ 3 | ² 6 |
| ³ 4 | 5 |

Reasoning

- 1 Across is a two-digit square: 16, 25, 36, 49, 64, 81.
- 3 Across is a two-digit triangular number: 10, 15, 21, 28, 36, 45, 55, 66, 78, 91.
- 2 Down is a multiple of 5, so the bottom-right digit is 0 or 5. Thus 3 Across must be 10, 15, 45, or 55.
- 1 Down is a two-digit even number whose digits are consecutive in increasing order: 12, 34, 56, 78.
- The first digit of 3 Across is also the second digit of 1 Down. Among 10, 15, 45, 55, the first digit is 1, 1, 4, or 5, while among 12, 34, 56, 78, the second digit is 2, 4, 6, or 8. The only possible shared digit is 4, so 3 Across is 45 and 1 Down is 34.
- This fixes 1 Across as 36, and 2 Down becomes 65.

Puzzle 2

| | | |
|-------------------|-------------------|-------------------|
| ¹ 3 | ² 2 | ³ 4 |
| ⁴ 1 | 2 | 5 |
| ⁵ 5 | 7 | 6 |

Reasoning

- 3 Down is one of 234, 456, 678.
- 4 Across is a cube: 125, 216, 343, 512, 729.
- 5 Across is a three-digit square beginning with 5, so it is 529 or 576.
- The first digit of 5 Across is also the last digit of 1 Down. Since 1 Down is a multiple of 35, that digit must be 0 or 5. Therefore 5 Across cannot be 529, so 5 Across is 576.
- This fixes the last digit of 3 Down as 6, so 3 Down must be 456.
- Now 4 Across must end in 5. The only three-digit cube ending in 5 is 125, so 4 Across is 125.
- 2 Down becomes 227, which is prime.
- Finally, 1 Across must be a three-digit square divisible by 9 ending in 4. The only possibility is 324.