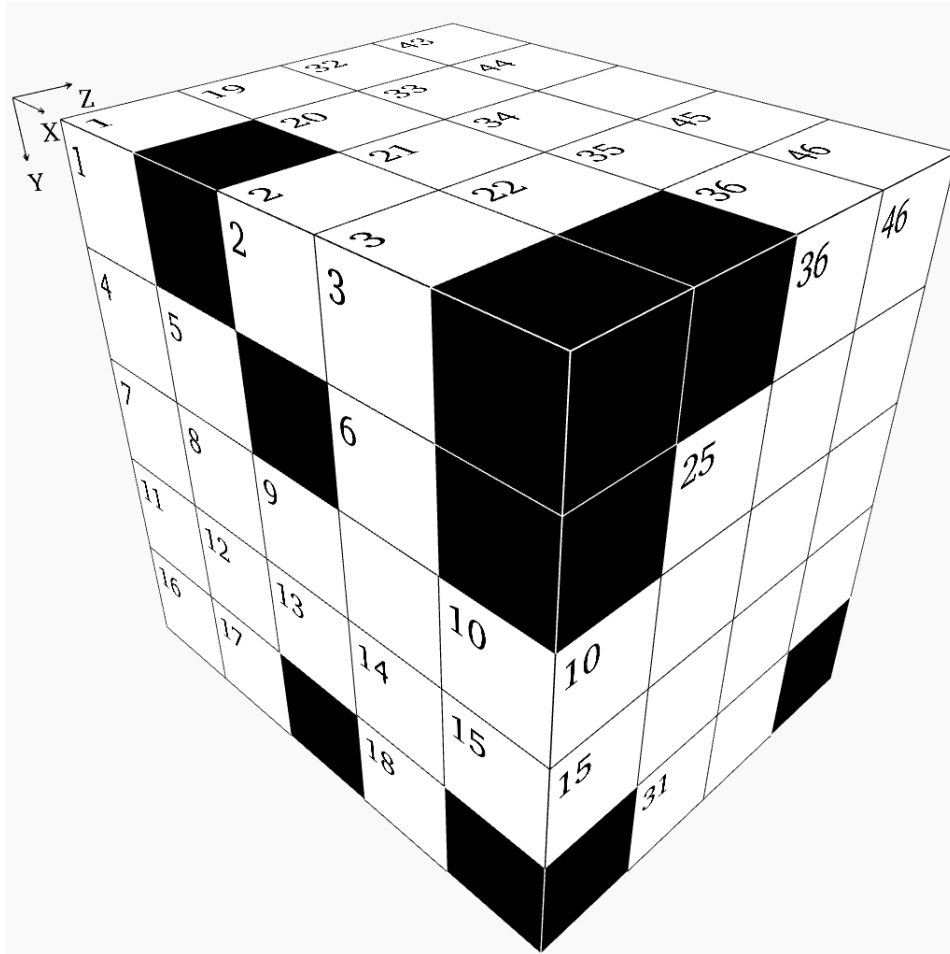


Difficulty: ★★★★★

## Box - Hard Puzzle #4



This puzzle is like a crossword, but with numbers. Each digit occupies a 3D block and can be a part of a "word" in the X,Y, and Z directions.

### Rules:

1. "Words" may not start with a zero.
2. "Words" in the X direction read from left to right.
3. "Words" in the Y direction read from top to bottom.
4. "Words" in the Z direction read from front to back.
5. There is one unique solution which satisfies all the clues given below.
6. Some "words" may not have clues. They will be determined by the "words" which intersect them.

If we take the box pictured above and divide it into individual X-Y layers, we will get these planes:

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  |    | 2  | 3  |    | 19 | 20 | 21 | 22 |    | 32 | 33 | 34 | 35 | 36 |
| 4  | 5  |    | 6  |    | 23 |    | 24 |    | 25 | 37 |    |    |    |    |
| 7  | 8  | 9  |    | 10 | 26 |    |    |    |    |    | 38 |    | 39 |    |
| 11 | 12 | 13 | 14 | 15 | 27 |    |    | 28 |    | 40 |    |    |    |    |
| 16 | 17 |    | 18 |    | 29 |    |    | 30 | 31 |    |    |    |    |    |
|    |    |    |    |    | 43 | 44 |    | 45 | 46 |    |    |    |    |    |
|    |    |    |    |    | 47 |    |    | 48 |    |    |    |    |    |    |
|    |    |    |    |    | 49 |    | 50 |    |    |    |    |    |    |    |
|    |    |    |    |    | 51 |    |    |    |    |    |    |    |    |    |
|    |    |    |    |    | 52 |    |    |    |    |    |    |    |    |    |

### X Direction

- 2 Half of Y33, then subtract Y43
- 4 Mean of Z36 and Z39
- 7 Five times a square
- 11 Mean of Y36 and Z5
- 16 Z39 plus X4
- 19 A prime number
- 23 Seventy-seven times a prime number
- 26 Three times X30
- 27 Three times a prime number
- 29 A square
- 30 Z16 minus Z24
- 32 X38 plus half of Y34
- 37 Eighty-eight times a prime number
- 38 One thousand two hundred ninety-six less than Z2
- 40 Z17 plus X48
- 41 Last two digits are the same as last two digits of Y36
- 43 Twice a prime number
- 47 Mean of Y28 and Z36
- 48 X2 minus X47
- 49 Sixty-two times Z18
- 51 Twenty-three times a prime number
- 52 One hundred ninety-nine more than Y50

### Y Direction

- 1 Its digits total Y28
- 3 A prime number
- 5 Four hundred ninety-four less than X40
- 9 Z42 minus Z16
- 10 Mean of Y9 and X2
- 19 Z11 plus Y46
- 20 Sixty-nine times a prime number
- 21 Y46 minus Z24
- 22 Sum of digits in Y45
- 25 X52 minus X16
- 28 Z13 minus X19
- 32 Three-fourths of X48
- 33 Sixteen times a prime number
- 34 Twelve times a prime number
- 35 Z12 times X4
- 36 Seven times a prime number
- 43 A prime number
- 44 A prime number
- 45 Eight hundred four less than Y33
- 46 Thirty-three times a prime number
- 50 Five times a prime number

### Z Direction

- 1 A prime number
- 2 One thousand five hundred sixty-seven more than Y21
- 3 Y5 divided by three
- 4 Fourteen times a prime number
- 5 Thirty-seven times a prime number
- 6 X43 minus X7
- 7 Z42 minus Z16
- 8 Mean of Z2 and Y50
- 9 A prime number
- 10 Mean of X26 and Z17
- 11 Twenty-three times a prime number
- 12 X52 plus Z31
- 13 Y32 plus X19
- 14 Consecutive digits in descending order
- 15 Mean of Z4 and Z39
- 16 X26 minus X47
- 17 Nine times a prime number
- 18 Z31 plus X19
- 20 Fourteen times Y28
- 24 Z18 minus Z13
- 25 Y28 plus Z36
- 31 Z36 minus X30
- 36 Z16 plus Y28
- 39 Mean of Z24 and Z7
- 42 X48 plus Z31

**Solution:**

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