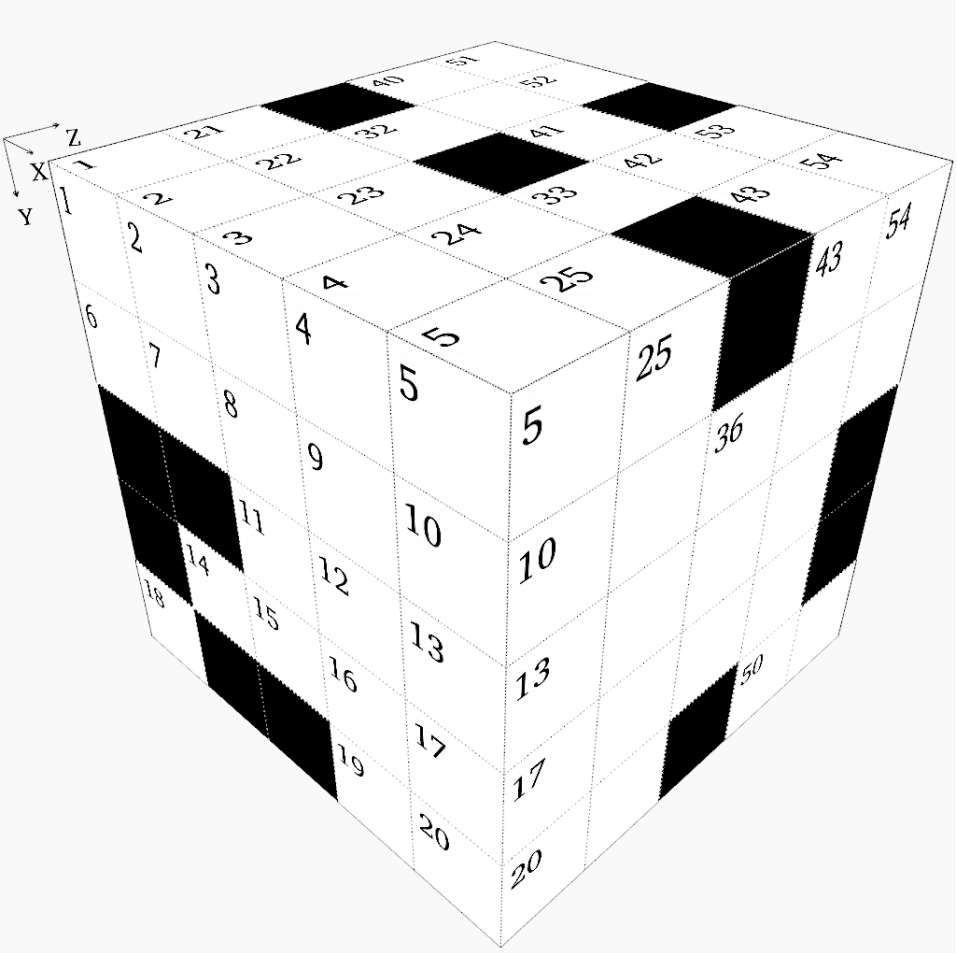
Difficulty: ★★★☆☆

Cube - Challenging Puzzle #23

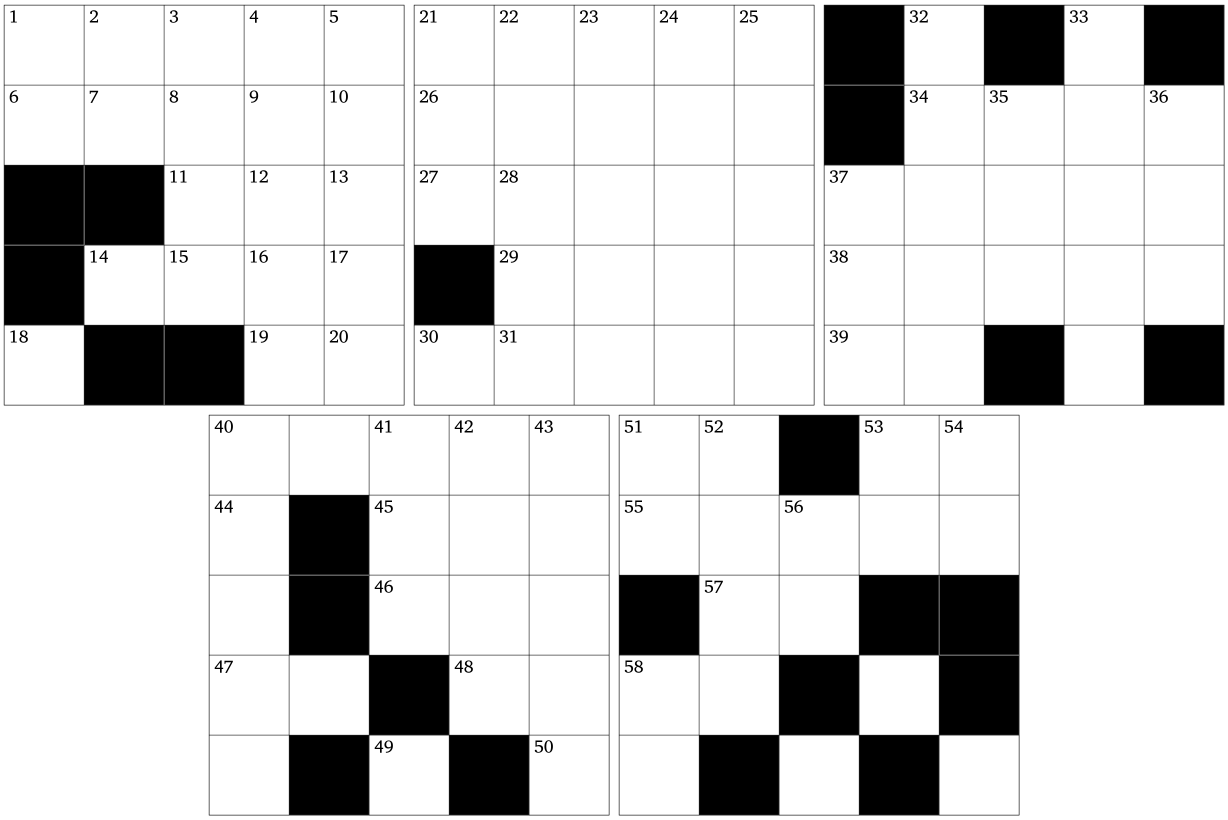


This puzzle is like a crossword, but with numbers. Each digit occupies a 3D block and can be a part of a "word" in the X,Y, and Z directions.

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 cube pictured above and divide it into individual X-Y layers, we will get these planes:



X Direction

1 Rearranged digits of X21
6 Three times a prime number
11 A square
14 Y52 plus half of Y53
19 Z50 minus X39
21 Eleven times a prime number
26 Z1 plus Z2
27 Y33 minus X34
29 Three times Y35
30 Mean of X26 and Z2
34 Six times a prime number
37 Three times a prime number
38 Twenty-nine times a square
39 Z43 minus Z28
40 Four thousand one hundred thirty-two more than Y40
45 Fourteen times Z31
46 Seven times a prime number
47 Z31 minus X58
48 X26 minus X30
51 Z38 minus Z49
53 X39 reversed
55 Three thousand nine hundred five less than Z14
57 Z50 minus Y1
58 Z4 divided by X29

Y Direction

1 A square
2 A square
3 Three times a prime number
4 A palindrome
5 Eleven times a prime number
21 Forty-nine times X48
22 Thirty-two times a prime number
23 First three digits are the same as first three digits of Y3
24 Thirty-seven times a prime number
25 Half of Z10, then subtract Z7
32 Ten thousand one hundred ninety-two more than Z10
33 Eight thousand eight hundred nine less than Y32
35 Mean of Z7 and X53
36 Y58 plus X45
37 X46 minus Z49
40 Twice the result of Z18 minus Y5
41 Half of X11, then subtract Z38
42 Its digits total X47
43 X21 minus half of Y35
51 Z5 plus Z31
52 A prime number
53 Mean of Z40 and X46
54 Z44 plus Y1
56 Sum of digits in Y4
58 Z43 minus Y54

Z Direction

1 Z40 minus X48
2 X30 minus X48
3 Mean of Y53 and Y56
4 X19 times X29
5 X47 plus Y54
6 Y2 plus X47
7 Four times a prime number
8 Nine thousand nine hundred six more than Z10
9 Two thousand nine hundred eighty-five more than Z16
10 Eighteen times a prime number
11 Mean of Y32 and Y36
12 Forty-nine times a prime number
13 A prime number
14 Three times a prime number
15 Twice a prime number
16 Y3 times X48
17 Three times a prime number
18 Five thousand one hundred seventy less than Y32
19 X46 plus Y54
20 Z31 minus X48
27 Ten times a prime number
28 A square
31 Z6 minus Y1
38 Y1 plus Y53
40 Mean of Z6 and Y1
43 A square
44 Half of Z43, then subtract X19
49 Mean of X47 and Z44
50 A prime number

Solution: