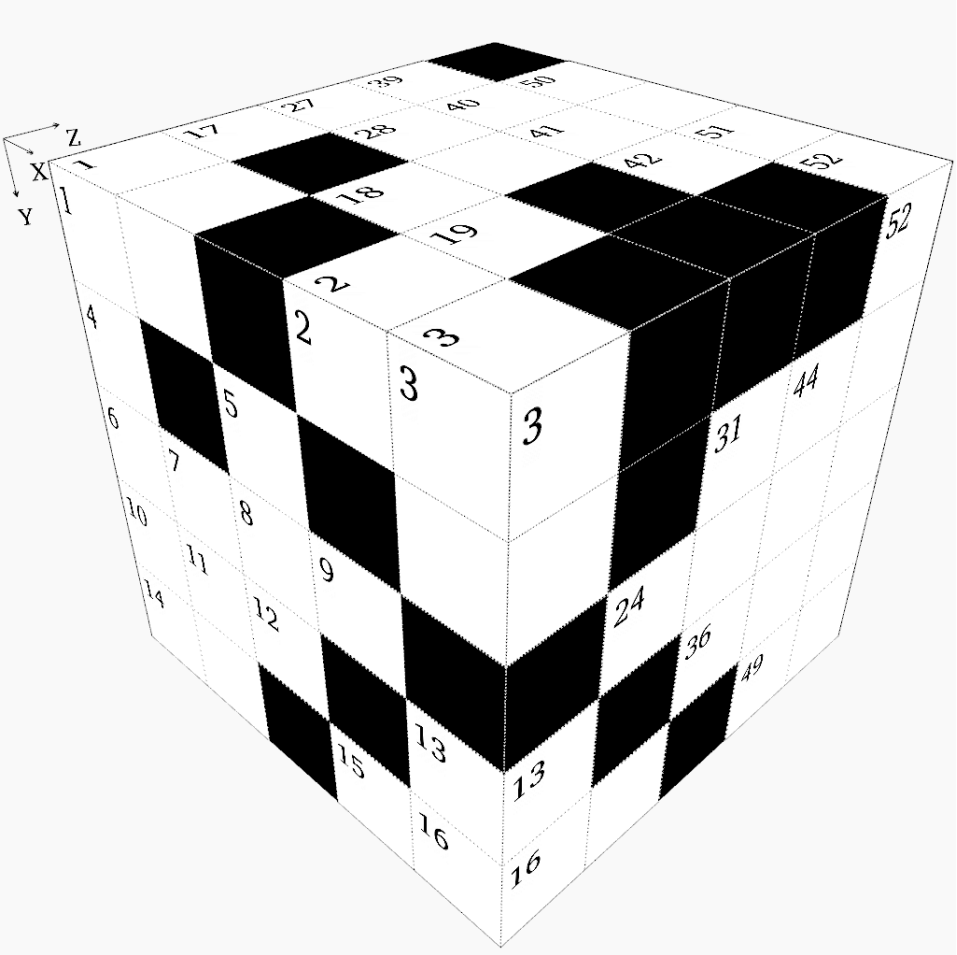
Difficulty: ★★★★☆

Cube - Hard Puzzle #47

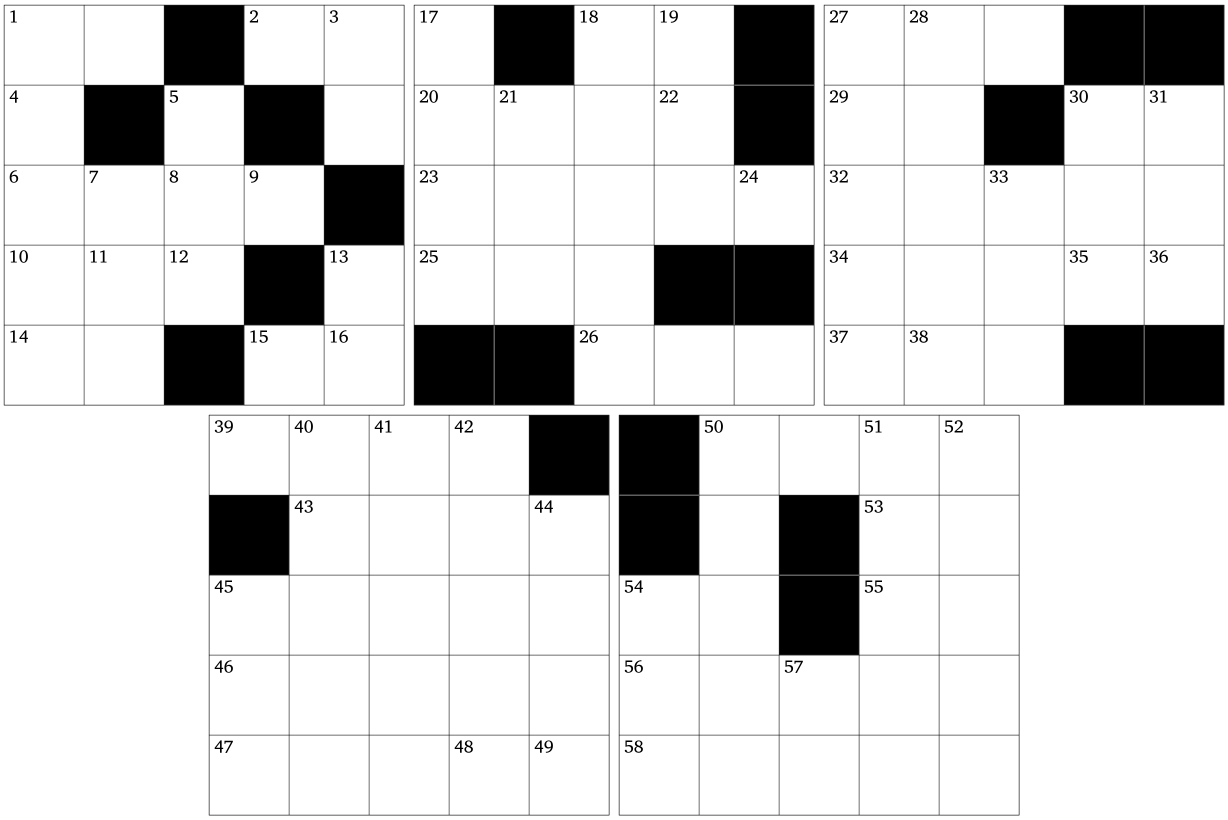


This puzzle is like a crossword, but with numbers. Each digit occupies a 3D block and can be a part of a "word" in the X,Y, and Z directions.

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 Z42 minus Z49
2 Z15 plus Z49
6 Ninety-one times a square
10 Z7 minus Z11
14 X27 minus Z48
15 Mean of X14 and Y3
18 Mean of Z49 and X29
20 Z22 plus Z28
23 A prime number
25 Z1 minus Y45
26 X30 plus Z37
27 Half of Z31, then subtract Z16
29 Y19 minus Z2
30 Y54 minus Z31
32 Three thousand five hundred sixty-nine more than Z7
34 Nine thousand three hundred eight more than Y28
37 Z31 minus X27
39 X58 divided by X30
43 Four times a prime number
45 Eighty times a prime number
46 Thirteen thousand seven hundred ninety-nine less than X58
47 Six times a prime number
50 A prime number
53 Two-thirds of Y19
54 A square
55 Z48 plus X18
56 First two digits are the same as first two digits of Z24
58 X39 times Z42

Y Direction

1 Twenty-three times a prime number
3 Y33 minus X37
5 Twenty-one times X18
7 Thirteen times Z42
13 Y44 divided by X2
17 Sixteen times a prime number
18 Y1 plus half of X32
19 X1 plus X55
21 Three times a prime number
27 Fifty-four times Z37
28 Twelve times a prime number
30 A square
31 Six times a square
33 Half of Y42, then subtract Z12
40 Thirty-six times a prime number
41 Five thousand three hundred fifty-five less than Y42
42 Six thousand four hundred seventy-seven less than Y18
44 X15 times X2
45 Consecutive digits in descending order
50 A prime number
51 Twelve thousand seven hundred ten less than Y28
52 Five thousand seven hundred fifty more than X58
54 Mean of Y7 and Z4
57 X6 divided by X54

Z Direction

1 Mean of X20 and Z36
2 Mean of Z48 and X53
4 Y7 plus X2
5 Z11 minus Y50
6 Y51 plus Y31
7 Z10 minus half of Y40
8 Last two digits are the same as last two digits of Y21
9 First two digits are the same as Y57
10 Four thousand two hundred sixteen less than X56
11 Twice a prime number
12 Forty-three times a prime number
15 Y31 minus X25
16 X1 plus Z15
18 Half of Y28, then subtract Y41
21 Twelve times a prime number
22 Mean of X39 and X18
24 Fifty-seven times a prime number
26 Nine times a prime number
28 Z36 plus X18
31 Mean of X1 and Y45
35 Mean of Y33 and X53
36 Z35 plus Z31
37 Mean of Z15 and Y31
38 Eleven times a prime number
42 X26 minus Z37
48 Half of Z4, then subtract Z35
49 X30 minus X1

Solution: