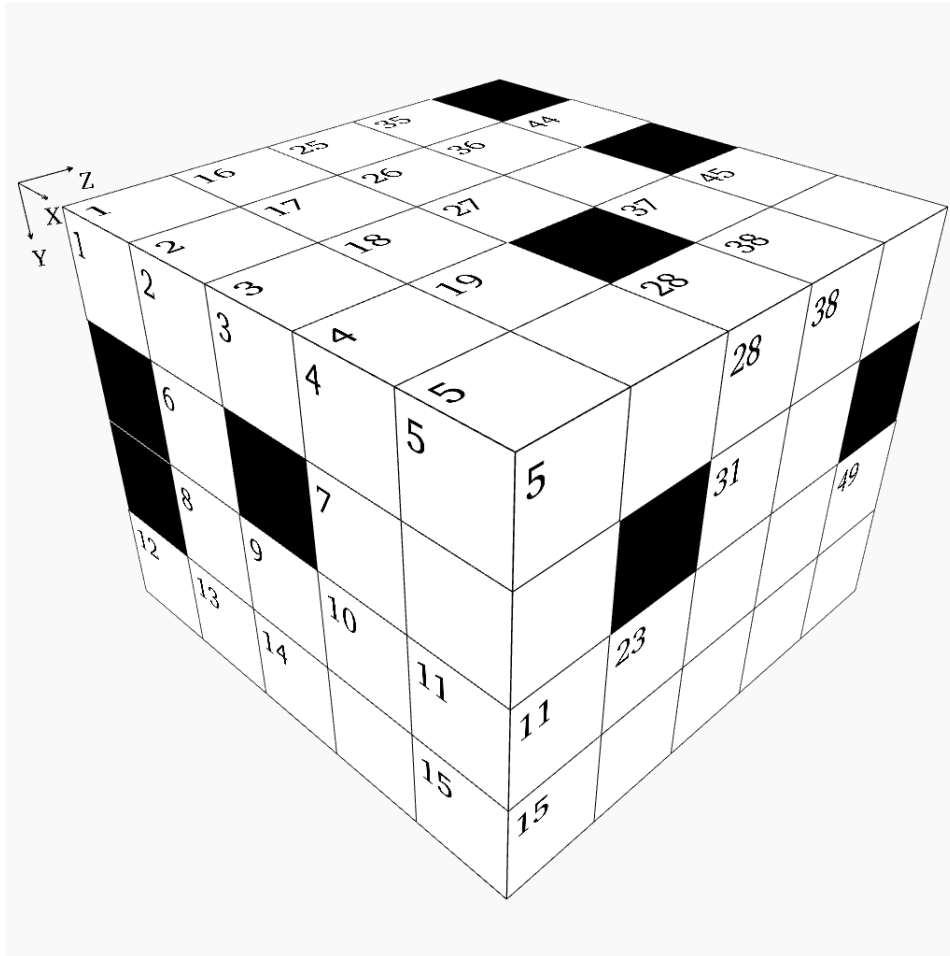# Box - Hard Puzzle #24

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:

X Direction
1 Seven times a prime number
7 Mean of Z4 and Z37
8 X29 minus Y23
12 Twice a prime number
16 Mean of X43 and Y36
20 Mean of Y28 and Z5
22 Eighteen thousand eight hundred eight more than Z2
24 Half of X29, then subtract Y26
25 Twenty-seven times a prime number
29 Last two digits are the same as Z37
32 Mean of Z2 and Y37
33 Eleven times a prime number
35 Twenty-three times a square
39 Mean of Y48 and X45
40 X33 divided by Y17
41 Z5 minus Y5
43 Seventy-one times a prime number
45 Mean of Z37 and Y23
46 Mean of Y42 and Y32
47 Mean of Y19 and Z33
50 Three thousand four hundred one less than X1

Y Direction
2 Twice the result of Z1 minus X47
4 Twenty-two times a prime number
5 Six times a prime number
9 Mean of Y45 and Z37
16 X50 minus half of X12
17 A prime number
18 Fourteen times a prime number
19 Sixty-five less than Y30
23 Twice Y49
26 Seven times a square
27 X45 plus X8
28 A prime number
30 Mean of Y23 and Y46
32 Y42 minus X7
35 Y32 minus Z37
36 Seven times a prime number
37 Sixteen times a prime number
38 Seventeen times a prime number
42 X46 plus half of Y9
44 Nine times a prime number
45 Mean of X39 and Z31
46 Consecutive digits in descending order
48 Mean of Y49 and Y32
49 Mean of Z39 and Y35

Z Direction
1 A prime number
2 Five thousand eight hundred fifty-three less than X33
3 X35 minus Y17
4 Three times X24
5 Nine times a prime number
6 X33 minus X29
7 Mean of Z9 and X1
8 A prime number
9 Eight thousand nine hundred sixty-eight less than X32
10 Z3 plus half of X8
11 A prime number
13 A prime number
14 Seventy-three times a prime number
15 Thirty times a prime number
21 A cube
22 Y49 plus Z21
31 Mean of Z37 and Y32
33 Y36 minus Y16
34 Twenty-four times a prime number
37 Y32 minus X24
39 Z22 minus Y32

Solution:

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

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