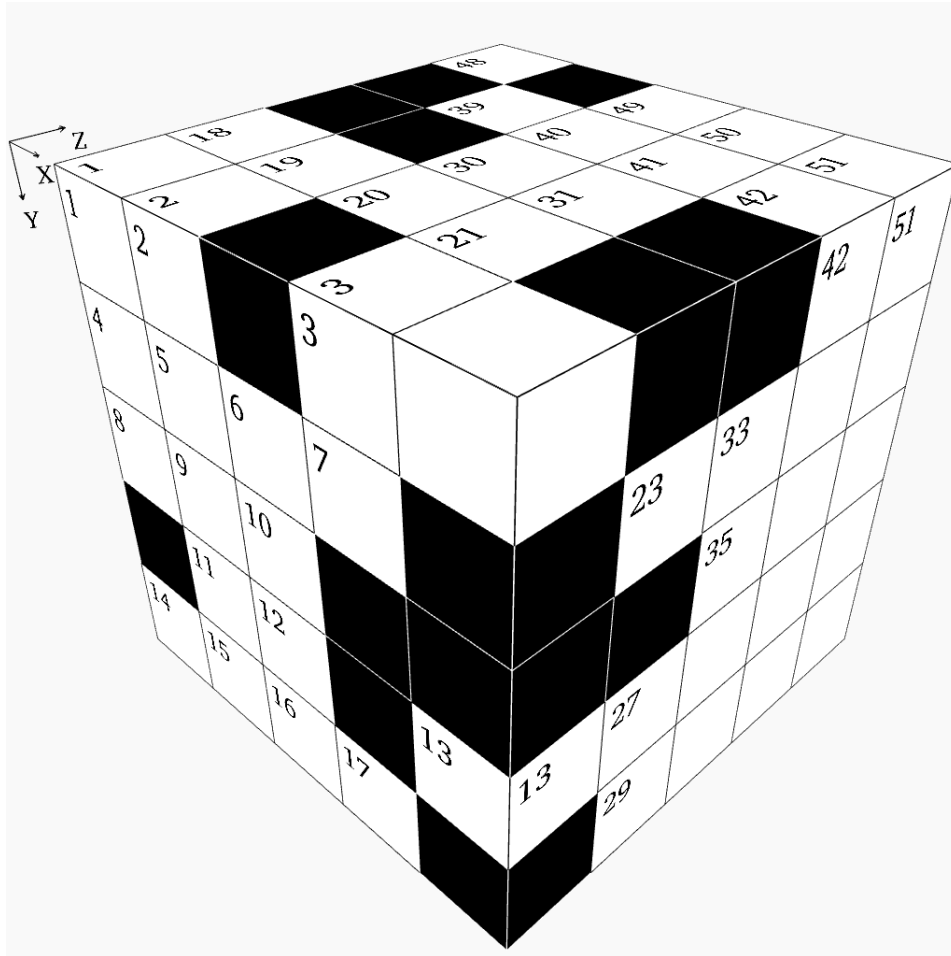# Cube - Hard Puzzle #46

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 Z4 divided by Z29
3 Half of Y41, then subtract X14
4 Nine times a prime number
8 Forty more than X49
11 Mean of Y49 and X55
14 Thirty-seven times Y56
18 X39 plus Z46
22 Y51 divided by three
24 Seven times a prime number
26 One thousand five hundred ninety-eight more than Y43
28 A prime number
30 Z42 minus X55
32 Four times a prime number
34 Four times Z2
36 Mean of Y39 and X14
38 Three thousand four hundred sixty-six less than Y40
39 Two thousand five hundred forty-seven less than X28
43 Last two digits are the same as Y49
44 Z35 plus Z46
45 Z46 plus Y39
47 Y20 minus Y48
49 Twice a prime number
52 Y42 minus half of Z42
54 Z14 divided by X57
55 Z3 divided by Z36
56 Mean of Z42 and X44
57 Twice a prime number

Y Direction

1 One hundred forty-eight less than X36
2 Seventeen thousand one less than Y50
3 Z42 minus X11
6 Twenty-two times a prime number
18 Thirty-two times a prime number
19 X38 minus half of Y18
20 A prime number
21 A prime number
27 Z2 minus X11
30 Three times a prime number
31 A prime number
32 Z23 minus X55
33 Twenty-five times a prime number
37 X47 minus X44
39 Z13 minus Y40
40 Three hundred thirty-seven less than Y48
41 A palindrome
42 Z46 plus X52
43 X4 plus half of X49
48 Sixty-eight times a prime number
49 Mean of Y56 and X1
50 Eight thousand two hundred sixty-five more than Y21
51 Forty-two times a prime number
53 Mean of X54 and Z2
56 Z5 divided by X56

Z Direction

1 A square
2 X45 minus Z42
3 Twice X26
4 Last two digits are the same as Z2
5 Sixty-two times a square
6 Thirteen thousand one hundred eighty-three less than Y50
7 Sixty-six times a prime number
8 A prime number
9 X45 minus X54
10 Twenty-six times a prime number
11 Mean of X56 and X8
12 Nine times a prime number
13 Four times a prime number
14 One thousand five hundred thirty-six more than Z25
15 Five times a prime number
16 First two digits are the same as Z1
17 Y30 minus X18
20 Three times a prime number
23 Y1 plus half of Y6
25 Z11 times Z9
29 Six times a prime number
35 A prime number
36 X47 plus Y3
42 X3 plus X55
46 Z1 minus Z9

Solution:

Top grid:

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

Bottom grid:

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

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