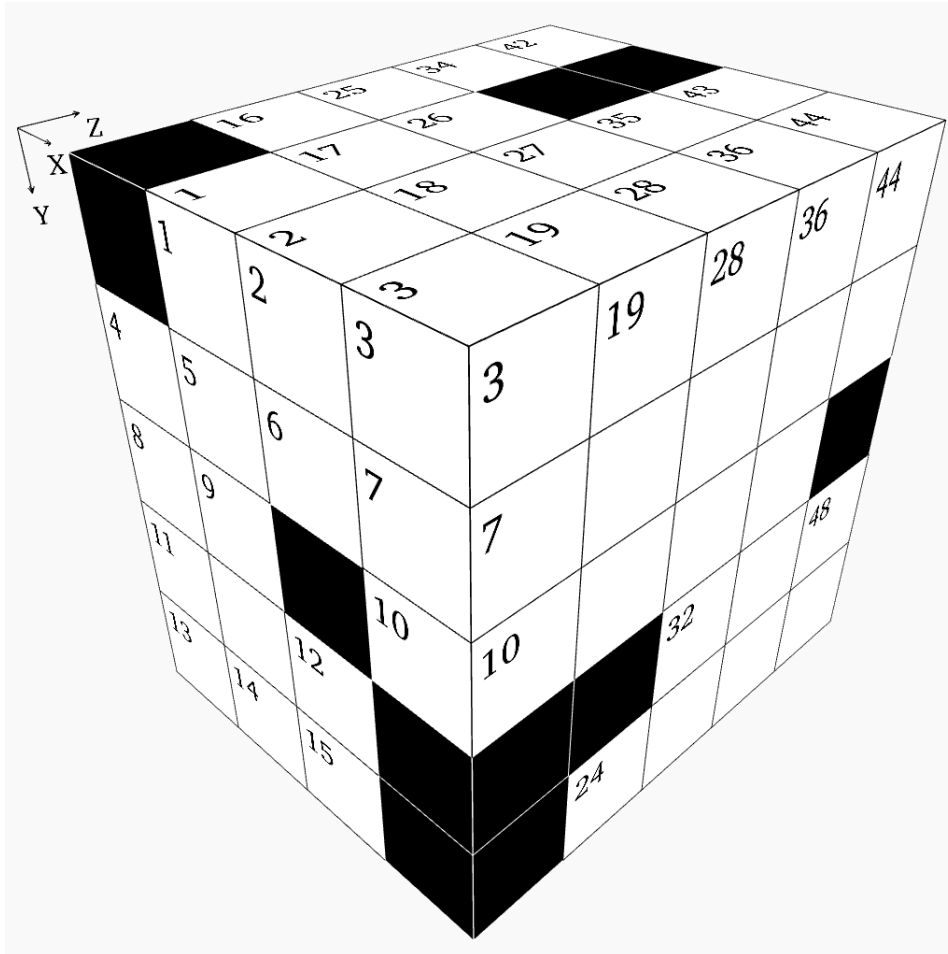# Box - Hard Puzzle #16

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		16	17	18	19		25	26	27	28
■													
4	5	6	7		20					29			
8	9	■	10		21		22			30			
11		12	■		■		■		■		31		32
13	14	15	■	■		23		24		33			

	34	■	35	36		42	■	43	44
37	38					45	46		
39		■				47			■
40		■				■	■		48
41						■		49	

X Direction

1 X11 plus X8
4 Four times a prime number
8 Sum of digits in X1
11 X13 minus Y43
13 X29 minus X8
16 Forty-nine times a prime number
20 Its digits total X49
21 Nineteen times a prime number
23 X11 minus X8
25 Four times a prime number
29 Mean of X45 and Y2
30 Twice a prime number
31 Z32 reversed
33 Six times a square
35 Mean of Z40 and X8
37 Seventy-one times X43
39 Mean of X40 and Z22
40 Same as Z31
41 A prime number
43 Y17 minus X47
45 Seventeen times a prime number
47 Ten times a prime number
49 Z40 minus X8

Y Direction

1 Three thousand nine hundred thirty-seven more than Y34
2 A square
3 A prime number
4 Nineteen times a prime number
12 Mean of Y3 and X8
16 Z3 minus half of Z10
17 Z32 plus Z22
18 A square
19 Three times a prime number
25 Twice a prime number
26 Nine hundred ninety-six less than Y42
27 Z16 plus X23
28 Sixty-eight times a prime number
34 Ninety-three times a prime number
35 Two-thirds of X40
36 Mean of Y28 and X30
38 Half of Y26, then subtract Z9
42 Six thousand six hundred seven more than Z2
43 Forty times X8
44 Y17 divided by fifteen
46 X23 divided by five
48 Y2 minus Y44

Z Direction

1 A prime number
2 Five thousand six hundred eleven less than Y26
3 Sixty-five times a prime number
4 A prime number
5 A prime number
6 Six times a prime number
7 Ten thousand twenty more than Z4
9 Eleven times a prime number
10 Last two digits are the same as Z22
11 Half of Y12
12 X43 plus Y17
14 A prime number
15 Twice the result of Y34 minus X47
16 A prime number
22 Mean of Z40 and Y46
24 One hundred six less than X4
31 Y2 minus Y44
32 X31 reversed
33 Half of X4, then subtract X33
40 X35 plus half of Y35

Solution:

Top grid:

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

Bottom grid:

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