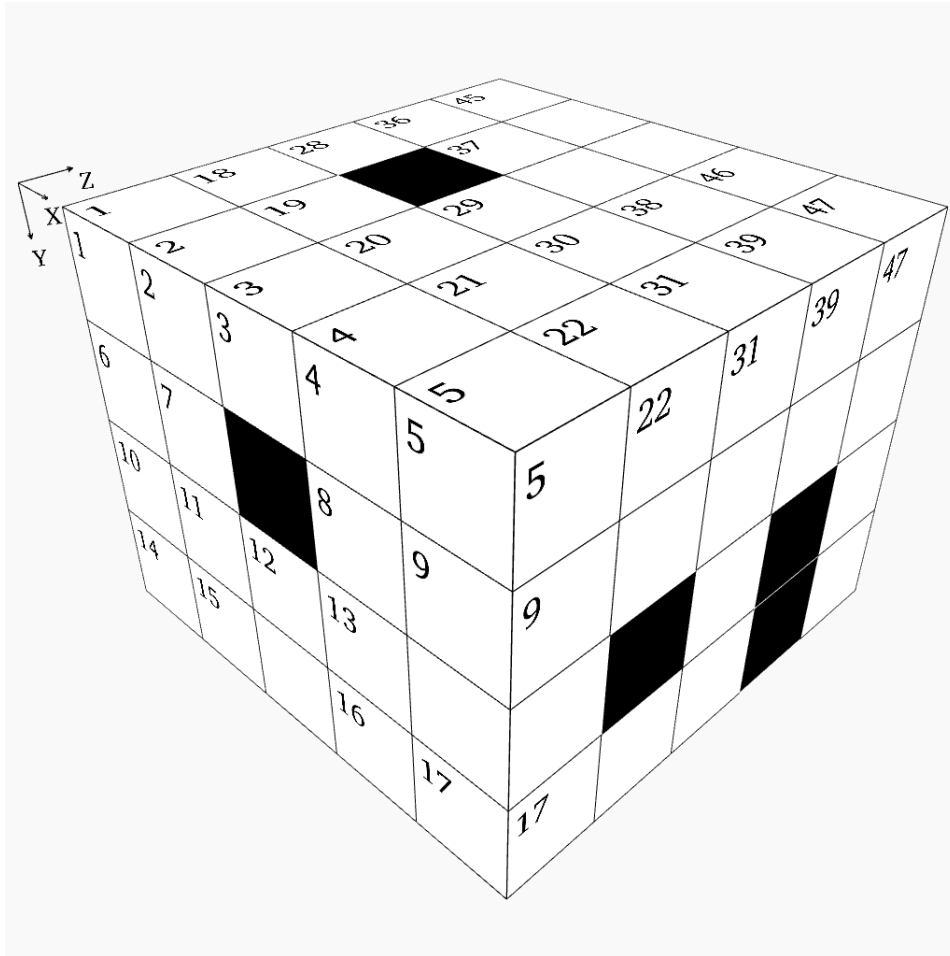# Box - Hard Puzzle #19

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	4	5
6	7	■	8	9
10	11	12	13	
14	15		16	17

18	19	20	21	22
23		24		
25		■		■
26		■	27	

28	■	29	30	31
32	33			
35			■	34
			■	■

36	37		38	39
■		■	40	
41		42		■
43			44	■

45			46	47
	■	■	48	
49	50			
51		■	52	

X Direction

1 A prime number
6 X40 minus Y12
8 Z9 minus X49
10 A prime number
14 Twice a prime number
18 Twice the result of X23 plus X43
23 Forty-three times a prime number
25 A square
26 Mean of X27 and X34
27 X35 plus Z2
29 Y33 minus Y50
32 Sixteen thousand four hundred nine less than X14
34 A square
35 Z10 minus X34
36 A prime number
40 X34 plus X26
41 Twice the result of X45 minus X36
43 Thirteen times a prime number
45 Two thousand eight hundred thirty more than Z5
48 Y42 minus Z37
49 Seventeen times a prime number
51 Mean of Y50 and Z24
52 Z2 plus Y41

Y Direction

1 Y29 times X52
2 Mean of Y46 and X40
4 Half of Y5, then subtract Y33
5 Fourteen times a prime number
12 Mean of Z10 and Z16
18 X6 plus X41
19 Thirty-eight times a prime number
20 Y22 plus X51
21 One thousand three hundred seventy-six more than Y31
22 A cube
28 Y31 divided by X27
29 Mean of X8 and Z41
30 Rearranged digits of X29
31 Y20 times X26
33 Z17 plus X48
37 Mean of Y29 and Y46
38 Thirty-one times a prime number
39 Y28 minus Y12
41 Mean of X51 and X26
42 Z44 minus half of Y12
45 A square
46 Twice a square
47 X51 plus Y37
50 X6 plus Z16

Z Direction

1 One thousand eight hundred nine less than Z9
2 Y20 minus Y42
3 Six thousand three hundred seventy-one less than Z1
4 Seventy-four times a prime number
5 Mean of X36 and X1
6 Twice a prime number
7 Twice a prime number
8 X29 times X25
9 Last two digits are the same as last two digits of Y33
10 Y47 minus Y37
11 A prime number
13 A prime number
14 Twice a prime number
15 Two thousand six hundred seventy-four more than Z4
16 X40 minus Z2
17 A square
24 X25 minus X8
37 A square
41 Mean of Z24 and X26
42 Mean of X35 and Z44
44 Y29 plus X27

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

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