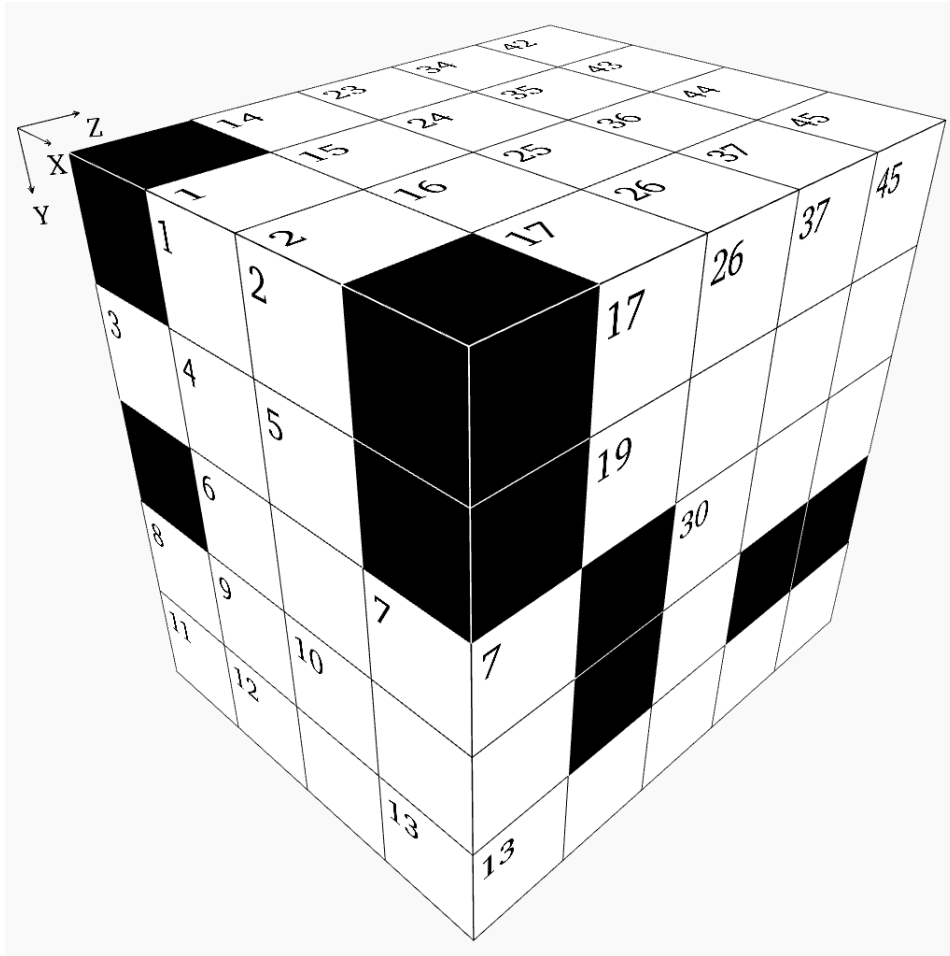# Box - Hard Puzzle #43



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 |    |

| 34 | 35 | 36 | 37 |
|----|----|----|----|
| ■  | 38 |    |    |
| ■  | 39 |    |    |
| 40 | ■  |    | ■  |
| 41 |    |    |    |

| 42 | 43 | 44 | 45 |
|----|----|----|----|
| 46 |    |    |    |
| 47 |    |    |    |
| 48 |    |    | ■  |
| 49 |    |    |    |

## X Direction

**1** Mean of Y17 and X22
**3** A prime number
**6** Eight times a prime number
**8** Mean of X42 and Y14
**11** Twice X46
**14** All digits are the same
**18** Seven times a prime number
**20** X21 minus Y17
**21** Same as Y8
**22** A prime number
**23** Thirteen times a square
**27** One thousand two hundred thirty-six more than X28
**28** Four times a prime number
**31** Seventy-one times a prime number
**32** X42 minus X38
**34** A palindrome
**38** Y45 plus X1
**39** Twice a prime number
**41** Mean of Y16 and X32
**42** Thirteen times a prime number
**46** A prime number
**47** Ninety times a prime number
**48** Eight times a prime number
**49** Mean of X28 and Y37

## Y Direction

**1** First two digits are the same as first two digits of X14
**2** Nine thousand seven hundred fifty-three less than Z11
**7** Y35 plus X3
**8** X38 divided by thirty-two
**14** Z29 minus Y40
**15** X31 plus X38
**16** Mean of X1 and X20
**17** Mean of X1 and Z20
**23** Six times a prime number
**24** Mean of Y42 and X41
**25** Thirty-three times a prime number
**26** Last two digits are the same as last two digits of X14
**35** A prime number
**36** X18 plus half of X47
**37** Six times a prime number
**40** Twice the result of Z20 plus Y16
**42** Nineteen times a prime number
**43** Twice the result of Y23 minus X11
**44** Five times a prime number
**45** Seventy times a prime number

## Z Direction

**1** Three times a prime number
**2** Five times a prime number
**3** Seven times a prime number
**4** Forty-eight times a prime number
**5** A cube
**6** A prime number
**9** Thirteen times a prime number
**10** Two thousand ninety-one less than Z2
**11** A prime number
**12** Mean of Z10 and X6
**13** Y25 plus half of X27
**14** Seventy-five times X22
**17** A prime number
**19** Y1 minus X23
**20** A square
**29** Consecutive digits unordered
**30** Twenty times a prime number
**31** Five times a prime number
**33** Last two digits are the same as last two digits of Z14

**Solution:**

Top grid (rows 1–5):

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

Bottom grid (rows 6–10):

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