**Contest: Spatial Relations Latitude (SPIRAL)**

**April 1, 2022 – June 20, 2022 11:59pm ET**

**Participants: 11**

**Test Designer: James Dorsey**

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## Contest Information

*Cheating*: Do not discuss answers/hints. *No time limit*. *Two attempts* and *reference aids* are allowed. *No penalty* for guesses/wrong answers.

## Spatial Relations Latitude (SPIRAL)

Observe the rotation and symmetry of the letters/numbers/symbols; for the solutions, use your keyboard – no drawing or software required!

### I.     Series

1.  Complete the series:

    ?        --       -       --       -       --

2.  Complete the series:

    .            ?               . . .           . . . .          . . . . .        . . . . . .

3.  Complete the series:

    o              O              o              O

         O              o              O              ?

### II.    Matrices

4.  Find the missing element in this matrix:

    ]            ?
    =|           |==|

5.  Find the missing row in this matrix:

    !!11!!11
    11!!11!!
    ?
    11!!11!!

6.  Find the missing element in this matrix (unlike the others, you can count on spending a lot of time trying to solve this matrix item):

    %       *       @
    %       *       %
    *       @       *

    *       @       %
    %       @       ?
    *       %       @

    @       %       *
    @       @       @
    *       %       %

### III.   Analogies

7.  Complete the analogy:

    6 : 9 :: p : ?

8.  Complete the analogy:

    v : ∇ :: 7 : ?

9.  Complete the analogy:

    { : } :: / : ?

### IV.    Odd-One-Out

10. Select the letter (A, B, or C) of the item that is different from the others:

    Q       X       D
    A       B       C

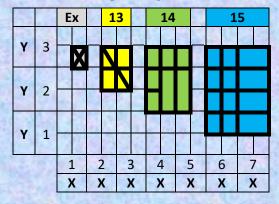11. Select the letter (A, B, C, or D) of the item that is different from the others:

    I       N       Z       U
    A       B       C       D

12. Select the letter (A, B, C, D, or E) of the item that is different from the others:

    )       |       [       +       ~
    A       B       C       D       E

### V.      Problem Solving

Find where the missing line needs to be in order to complete the pattern for items 13, 14, and 15 (the items are individually colored)

| | | Ex | 13 | | 14 | | 15 | | |
|---|---|---|---|---|---|---|---|---|---|
| Y | 3 | X | N | | | | | | |
| Y | 2 | | N | | | | | | |
| Y | 1 | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| | | X | X | X | X | X | X | X | |

Write coordinates going from left to right or top (corner) to bottom (corner). The missing line could be vertical, horizontal, or diagonal (each diagonal line is to be viewed as one continuous line connecting one corner of the bolded square to the other corner.

For example, imagine the following scenarios of missing lines for the smallest square in the example (Ex):
- If only the bottom horizontal line is missing, complete it with: Left (X, Y) = (1, 2.5) and Right (X, Y) = (1.5, 2.5)
- If only the right vertical line is missing, complete it with: Top (X, Y) = (1.5, 3) and Bottom (X, Y) = (1.5, 2.5)
- If only the \ diagonal (top left to bottom right) is missing, complete it with: Top corner (X, Y) = (1, 3) and Bottom corner (X, Y) = (1.5, 2.5)
- If only the / diagonal (top right to bottom left) is missing, complete it with: Top corner (X, Y) = (1.5, 3) and Bottom corner (X, Y) = (1, 2.5)

Please review the above examples before attempting the following items to understand the correct format for answering them.

13. Write the coordinates for item 13 going from left to right or top (corner) to bottom (corner) in the correct format:

    Left or Top (corner) (X, Y) = (?, ?) **and** Right or Bottom (corner) (X, Y) = (?, ?)

14. Write the coordinates for item 14 going from left to right or top (corner) to bottom (corner) in the correct format:

    Left or Top (corner) (X, Y) = (?, ?) **and** Right or Bottom (corner) (X, Y) = (?, ?)

15. Write the coordinates for item 15 going from left to right or top (corner) to bottom (corner) in the correct format:

    Left or Top (corner) (X, Y) = (?, ?) **and** Right or Bottom (corner) (X, Y) = (?, ?)

# Final Scoreboard (June 20, 2022)

| Ranking | Name | Country | 1st Attempt | 2nd Attempt | Mean Score | Prize |
|---|---|---|---|---|---|---|
| **Winner** | King Fuei Lee | Singapore | 14 | N/A | 14 | Free test submission and free society membership until July 31, 2022. |
| *2nd Place* | Nobuo Yamashita | Japan | 14 | 13 | 13.5 | Free test submission until July 15, 2022. |
| *3rd Place* | Tiberiu Sammak | Romania | 13 | N/A | 13 | ½-off test submission until June 30, 2022. |
| 4th Place | Susumu Ota | Japan | 12 | 13 | 12.5 | |
| 5th Place | Jim Lorrimore | England | 12 | N/A | 12 | |
| | Andrew Hayles | USA | 12 | N/A | | Secret Prize: given to all participants |
| | Mohammed Benazzi | Spain | 13 | 11 | | |
| 6th Place | Göran Åhlander | Sweden | 11 | N/A | 11 | |
| 7th Place | Lukáš Puškáš | Slovakia | 10 | N/A | 10 | |
| 8th Place | Hidden | Hidden | 9 | N/A | 9 | |
| 9th Place | Hidden | Hidden | 8 | N/A | 8 | |