

## Solutions

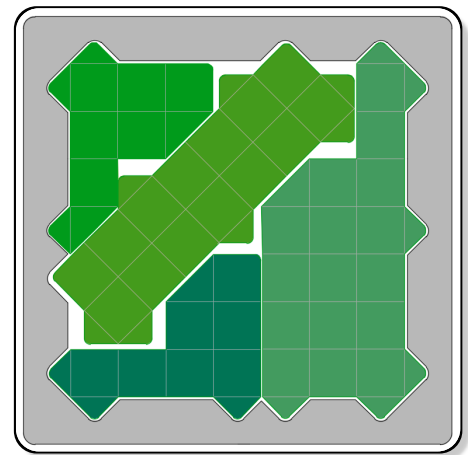
*AI Secrets Edition - Where Human Ingenuity Meets Artificial Intelligence*

**DESIGNERS' NOTE:** these solving suggestions are subjective and based on the puzzle designers' personal experience; we recognize that other solution paths may exist, and may even be more effective. Logic, reasoning, observation, and thinking outside the box are essential not only to excel in this competition, but beyond it. We encourage each participant to experiment with their own personal and creative approaches. What was your approach?

**SOLUTIONS**, rankings, puzzle kits from past editions, and more: [us.mechanicalpuzzlecompetitions.com](http://us.mechanicalpuzzlecompetitions.com)

### 1. BINARY 5 POINTS

**Answer: 0** **Hint:** All pieces seem to fit correctly when aligned with the frame and engraved grid, but after a few trials you may notice that this approach does not lead to a complete solution. The key is to look for a less obvious placement: one piece can be rotated by 45 degrees and fitted neatly into a specific angled position within the layout, while still partially following the engraved grid. This creates the space needed for the other pieces to fit precisely inside the frame. Once all four pieces are placed correctly, all 14 triangles are covered, so the answer is 0.



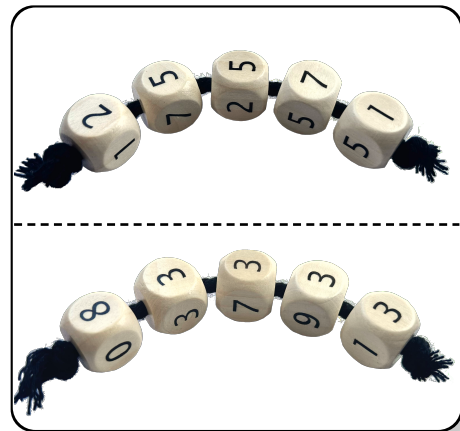
### 2. DRONE 6 POINTS

**Answer: 66** **Hint:** Although many numbers are visible and this may seem confusing at first, our suggestion is to reason by exclusion. In fact, you may notice that many gear positions are impossible because they cannot lead to a complete strictly increasing sequence. One gear in particular has only one valid position: the one showing 13 and 1, which marks the end and the beginning of the sequence. From there, the next gear also has only one position that works: 2 and 8. Although this creates a large gap in the sequence, the remaining gears allow you to complete the sequence correctly with 9-10 and 11-12. The visible numbers are: 1, 2, 8, 9, 10, 11, 12, 13, and the sum is 66.



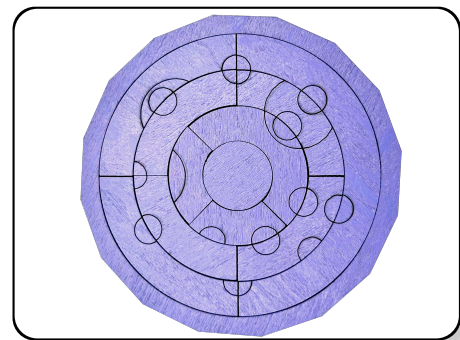
### 3. BIAS 7 POINTS

**Answer: 2** *Hint:* A useful first step is to calculate the sum of all the numbers printed on the cubes and divide it by 4, which suggests that each side should add up to 20. Then, it may help to start from a simple pattern, for example by placing similar numbers together, such as all the 5s or all the 3s, or from an arrangement that already seems close to the final solution, such as pairing larger numbers with smaller ones like 9 and 1. At this point, you can try rotating the cubes, aiming to make one side at a time sum to 20. Some rotations may fix one side but disturb another, so a possible way to solve the puzzle is to keep adjusting until all four sides are settled. If a specific starting point does not seem to lead anywhere, you can try a different starting arrangement. Once all four sides sum exactly to 20, 2 sides contain the number 5, so the answer is 2.



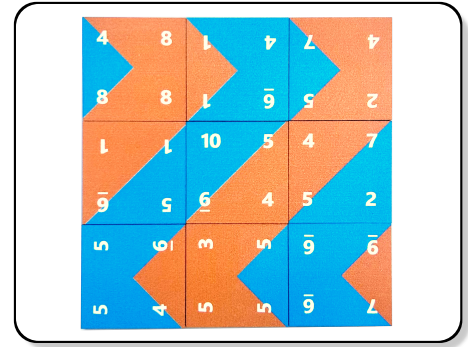
### 4. QUANTUM 7 POINTS

**Answer: 8** *Hint:* A good strategy is to first work outside the frame and divide the pieces into the three circular rings. For each ring, try connecting the pieces in the arrangement that creates the most partial circles at the joints, increasing the chance that they will later combine into full circles. For both the large and middle rings, this method reveals only one best arrangement. Then you can place these two rings inside the frame together with the small-ring pieces in the combination that forms as many circles as possible. This means completing the apparently optimal group of 3 connected circles: one large circle with two smaller ones inside. This arrangement looks almost optimal, but from there, rotating the outer ring one quarter-turn counter-clockwise creates additional complete circles, even though it breaks that group of three, bringing the total to 8.



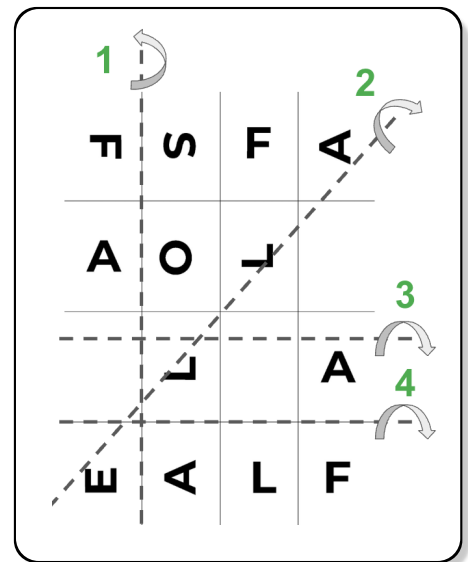
5. **DATA CENTER** 8 POINTS

**Answer: 20** *Hint:* One piece worth examining first is the square containing three 8s, as it is highly constrained. As a consequence of the puzzle instructions, valid contacts require the two touching sides to have the same color and the same difference between their two numbers. Based on this, you may notice that the two sides with a 4 are difficult to connect: the orange 4–8 side has no valid orange match, while the blue 4–8 side only seems to match one other side, but in the opposite order. This suggests that the square may need to go in a corner, connected through its two orange 8–8 sides. These can only match the two squares with orange 1–1 sides, so the orange sum is  $8 + 1 = 9$ . There are only two ways to attach these two squares. One makes it impossible to complete the area with the inner square, so the other arrangement is the correct one. This also fixes the position of the fourth square and suggests that the blue contact sum is 11. At this point, the rest of the  $3 \times 3$  grid can be completed, leading to the corner numbers 4, 4, 5, and 7, which sum to 20.



6. **PROMPT** 8 POINTS

**Answer: 4** *Hint:* A useful suggestion is to start from a near-solution configuration: you may notice an 'ALF', but with the initial A reversed. You can start by folding from the back side (1) to bring a correctly oriented A into position. To find the last A, you may need to think beyond the printed grid: a diagonal full-sheet fold (2) can move one of the A letters into a spot where it can be flipped into the correct orientation and position (3), revealing 'ALFA' as required. Finally, one more fold (4) hides the remaining visible letters. Therefore, the minimum number of folds required is 4.



## 7. NEXUS 9 POINTS

**Answer: 3** *Hint:* A helpful approach is to begin with the larger pieces, since they strongly limit the possible arrangements. Several pieces are already 3 units long, so you can often infer what space they should occupy in the final cube. The green piece can be especially useful as a reference, because its shape helps define part of the cube's outer frame. The orange piece is also highly constrained, so it may help to use it as a base and build around it. From there, you can try adding the other pieces to complete more of the cube's structure, adjusting them by trial and error. Careful observation is important, because many placements may look possible at first but leave gaps that cannot be filled. Once the cube is completed, only the number 3 remains visible, so the final answer is 3.

