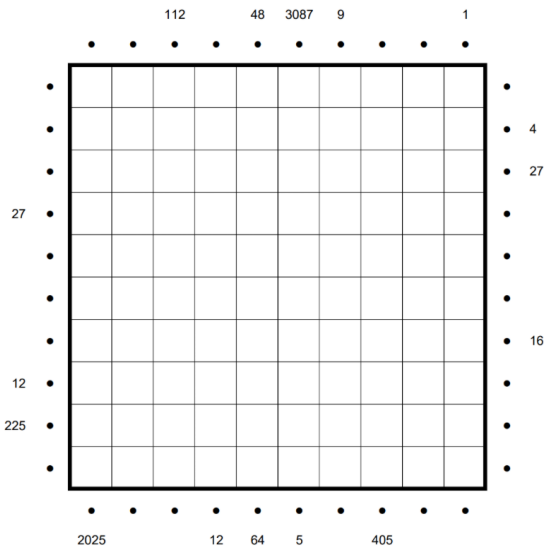
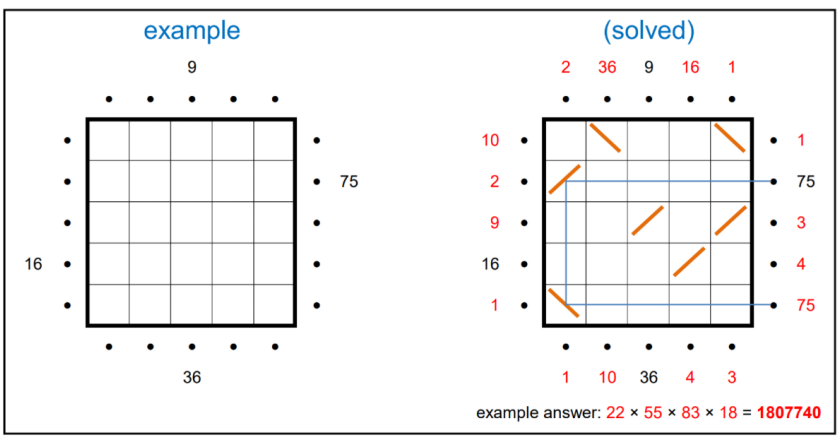
March 2025 Jane Street Solution

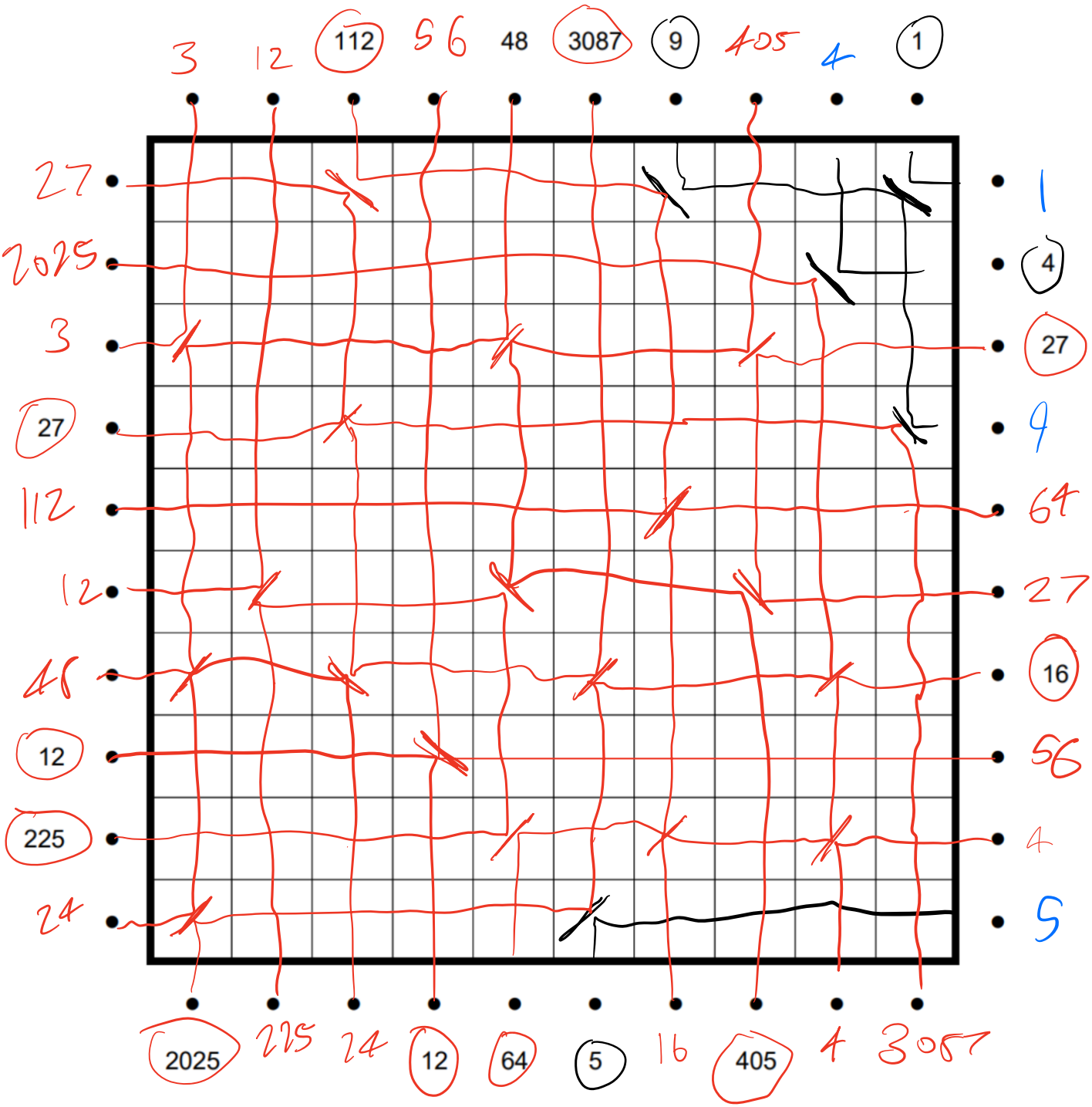




The perimeter of a 10-by-10 square field is surrounded by lasers pointing into the field. (Each laser begins half a unit from the edge of the field, as indicated by the •'s.)

Some of the lasers have numbers beside them. Place diagonal mirrors in some of the cells so that the **product** of the **segment lengths** of a laser's path matches the clue numbers. (For instance, the segments for the "75" path in the example puzzle have lengths 5, 3, 5.) Mirrors may not be placed in orthogonally adjacent cells.

Once finished, determine the missing clue numbers for the perimeter, and calculate the sum of these clues for each side of the square. The answer to this puzzle is the **product** of these **four sums**.


3
12
112
56
48
3087
9
405
4
1
27
2025
3
27
112
12
48
12
225
24
1
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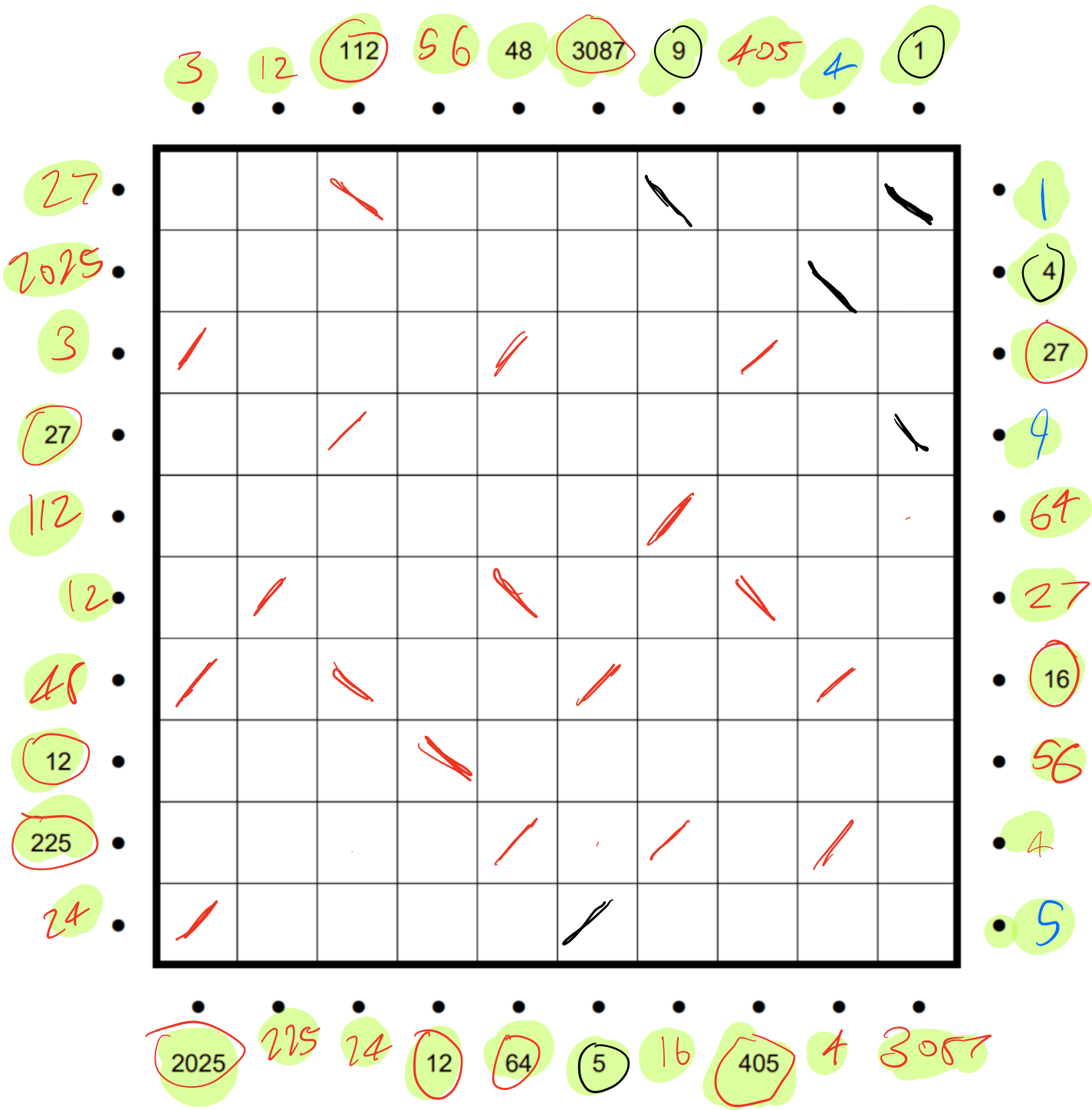

Left: 27 + 2025 + 3 + 112 + 12 + 48 + 24 = 2251

Bottom: 225 + 24 + 16 + 4 + 3087 = 3356

Right: 1 + 64 + 27 + 56 + 4 + 5 = 166

Top: $3 + 12 + 56 + 405 + 4 = 480$

$2251 \cdot 3356 \cdot 166 \cdot 480$

$= 601,931,086,080$

General strategy: I began with the two primes on the board to start with. The 1 in the top left made clear the placement of the mirror for the 4 also in the top left. From there, I used the prime factorization of the remaining numbers to identify possible paths given the hints. The 3087 at the top was easy to work with since the path required three separate segments of length 7. From there, other paths followed.