



The Benefits of Tackling Full House Problems

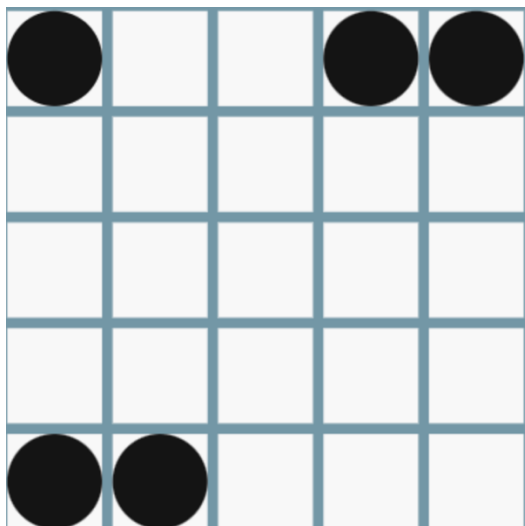
By Ed Meyer

Tackling any challenging problem for a long time develops mental strength and mental stamina. It also develops grit, tenacity, and the ability to handle frustration. These skills are rare and getting rarer, so anyone who has developed them will be in demand.

The Full House problems are certainly a great opportunity to develop mental stamina. They were invented by Puzzle Master, Erich Friedman, who formerly was a math professor at Stetson University. He has created a wide variety of fascinating puzzles. A link is here:

<https://erich-friedman.github.io/puzzle/>

The subject of this article is the Full House puzzle. A sample grid is shown below.



The Black circles are “bollards” that act as barriers. The goal of the puzzle, as its name suggests, is to completely fill all the unoccupied squares. The player can start on any unoccupied square and move in any of the four directions: up, down, left, and right.

The player, however, has no option with regards to the distance traveled in the chosen direction. Any move travels the maximum number of unoccupied squares until it hits the edge of the grid, a bollard, or a previously drawn path.

for a video description of the game, click the link below.

<https://twitter.com/Gedanken Inst/status/1800581907555794998>

The solution to every puzzle is unique. The best way to understand how the game works is to play it. Here is a link puzzle I recently tweeted out.

<https://twitter.com/Gedanken Inst/status/1800143633498124464>

and there are many, many more puzzles here:

<https://puzzles.pixeled.site/full-house>

Struggling with Full House puzzles to develop mentally is very similar to swimming laps to develop physically. The development comes from the struggle.

If you think that struggling with Full Board puzzles is a waste of time because you will never use it in the “real world,” it is likely that you will never develop the ability to think critically and deeply about a challenging problem that you encounter later in life. For example, financial problems, relationship problems, and career problems.

If a young person struggles with a Full House problem for a long time and eventually gets it, it can be a transformational moment in their lives. The dopamine rush that comes with success after a long struggle can be very rewarding.

When we teach the general problem solving class at BWU, we have a “Full House Day” in which the students invest (a much more appropriate word than spend) 75 minutes struggling mightily with a set of Full House challenges. Some students solve two, some solve ten. All of them develop their tenacity, grit, and spatial reasoning skills and all need a nap after the exhilarating mental workout.

Let me know how you do!





Making Progress on Grand Challenge TWO – Part II

By Ed Meyer

In the May issue we started exploring the solution space for Grand Challenge TWO, which is

Six standard dice are rolled. What is the probability that exactly four of the possible numbers appear? Note that a gambler in the 1700s knew that the result was very close to 50%, but he nor any mathematician he asked could calculate it. Can you?

If we imagine a table of all 46,656 possible permutations, it will begin with a 1-1-1-1-1-1 in the upper left corner and end with a 6-6-6-6-6-6 in the lower right corner. Every possible permutation of the digits 1 through 6 appears in the table exactly once.

To solve this problem, we have to “count” the number of permutations that have exactly four of the six possibilities. It would take a very long time to count them by hand, so let’s try to be clever and exploit some symmetry and use multiplication to efficiently count.

Let’s start with the triplet and three singlets, and let’s only consider the permutations in which the triplet consists of three 1s.

We’ll start by assuming that the 1’s appear on the green, blue, and red dice, as shown below.

Green	Blue	Red	Yellow	Orange	Purple

The first combination of singles we’ll consider, naturally, is 2-3-4. In the example shown above, the yellow die shows a 2, the orange die shows a 3, and the purple die shows a 4. In our imaginary table, this roll will appear as 1-1-1-2-3-4.

There are six permutations of the combination of a 2, a 3, and a 4 among the yellow, orange and purple dice. These are shown at the top of the next column.

Yellow	Orange	Purple

These six each has a spot in the table of the 46,656 permutations.

They are 1-1-1-2-3-4, 1-1-1-2-4-3, 1-1-1-3-2-4, 1-1-1-3-4-2, 1-1-1-4-2-3, and 1-1-1-4-3-2.

Each combination of the three singlets appears six times in the table for each triplet, which is three 1’s in this case.

Now let’s consider different singlets. So far, we have considered only the combination of 2-3-4. Let’s list the others carefully and methodically.

- 2-3-4 2-5-6
- 2-3-5 3-4-5
- 2-3-6 3-4-6
- 2-4-5 3-5-6
- 2-4-6 4-5-6

There are ten. Each of these ten combinations of numbers will have six permutations. Now we can count with multiplication instead of addition and conclude that there are sixty different permutations of the yellow, orange, and purple dice in which all the numbers are different and do not include a 1.

What do you think we have to do next?

Part III will appear in the July newsletter.

If you are interested in getting coached through this or any Grand Challenge, email emeyer@bw.edu





Quote Acrostic

edmeyer.phd

Instructions: Fill in the words at the bottom from the clues. Then write those letters in the grid at the top to reveal a quote. Black squares indicate the end of a word and punctuation has been removed. When you're done the first letters of the answers to the clues will be the author and subject of the quote.

QUOTE

1J	2K	3E	4A		5K	6B	7G		8J	9L	10E	11A		12B	13H	
14E	15C	16F	17M		18E	19G	20C	21N	22A	23J		24C	25J	26E	27I	
28I	29L	30F	31K		32K	33D	34L		35H	36N	37B	38M	39K			
40A	41N	42M	43I		44J	45H	46L		47J	48A	49L	50F		51J	52H	
53N	54I	55A	56N		57L	58A	59N	60J	61B	62I	63L	64H				
65I	66J	67C	68G		69L	70B	71J	72M		73C	74A	75N	76G			
77D	78J	79E	80N		81D	82J	83H	84M		85E	86N		87L	88D	89E	90K

CLUES

- A. Political discussion venue
- B. Speak loudly
- C. Little hooter
- D. Sharpen
- E. One of the pachyderms
- F. Allow
- G. Stringed instrument
- H. Not riding
- I. Stinging plant
- J. Streisand classic
- K. Bio or circadian
- L. Ill
- M. Entice
- N. 5 pm to 6 pm?

