Hello everyone,

1. Find an example of a sequence from an outside resource.

I chose the Connell sequence: {1, 2, 4, 5, 7, 9, 10, 12, 14, 16, 17, ...}

1, 2, 3, 4, 9, 8, 15, 14

{1, 2, 4, 9}

2. Define the sequence in ***three different ways***.

Listing the terms of the sequence: 1, 2, 4, 5, 7, 9, 10, 12, 14, 16, 17, …

Closed Formula:

$$a_n = 2n - [\frac{1}{2}(1 + \sqrt{8n - 7})]$$

Triangle:

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 1   2   5  10  17 . . .
 4   7  12  19
 9  14  21
16  23
25
 .
 .
 .
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3. Determine if your sequence is arithmetic, geometric, or neither.

Connell is not arithmetic because the terms do not differ by a constant. The sequence is also not geometric because the ratio between successive terms is not constant.

4. Discuss which representation of the sequence is best in this case, and why.

I think listing the terms and the triangle allow for a quick detection of the pattern (starting with the first odd number, then two even numbers, then three odd numbers, and so on). For every diagonal in the sequence, you can see that the numbers are all even or all odd, with each diagonal alternating.

Thanks,

Lauren Alexandra

References

Weisstein, Eric W. "Connell Sequence." MathWorld--A Wolfram Web Resource. https://mathworld.wolfram.com/ConnellSequence.html

1. In your responses to peers, **compare your sequence with theirs** and **discuss the different preferences for how each sequence is best defined**. Be sure to ask follow-up questions whenever possible.

Your sequence starts with first position as odd number, then 2 even numbers and then 3 odd number and then four odd numbers.

Definitely a good way to check the integrity of the sequence representation. In the other hand, my sequence is opposite to you, it is start with two odd numbers, then one even number, then two odd numbers, then one even number. My sequence always has a maximum of double numbers where your sequence identical numbers are always increasing.

Your choice of a sequence looks much simpler than my choice (Lazy Caterer's sequence) in reference to the list of terms.

Not only does your sequence have repetitive terms, the values for those terms do not increase rapidly within their sequence.

The terms in my sequence of choice do not repeat, and they have a moderate increase in value.

I agree with you on that the list representation for this sequence is simple and beautiful. I think the nth term formula is the most practical way to represent a sequence.

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Connell sequence: {1, 2, 4, 5, 7, 9, 10, 12, 14, 16, 17, ...}

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Catalan Numbers sequence is {1, 1, 2, 5, 14, 42, 132, 429, 1430, 4862, ...}

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Hi Richard,

Our sequences (Connell and Catalan) share common terms, {1, 2, 5, 14}, but your terms increase rapidly. Given your closed form, this is expected:

I agree with you that the closed form looks easier to work with than the recursive formula. I also think it provides a better representation than listing out the terms of the sequence.

Lauren

Hi Maria,

Our sequences (Connell and Yellowstone) begin with common terms, {1, 2, 4, 9}. In Connell, every other diagonal shares a common factor of 2 (given an even diagonal). Similar to your sequence, the 4th number in the sequence shares a common factor but with the 7th number, and the 5th number shares a common factor but with the 9th number. Further, it's hypothesized that like Connell, Yellowstone alternates between even and odd terms, except when an even term is reached which is twice a prime, then the alternation of even and odd terms is disrupted (Applegate et al., 2019).

Lauren

Applegate, D. L., Havermann, H., Selcoe, R. G., Shevelev, V., Sloane, N. J. A., & Zumkeller, R. (2019). The Yellowstone Permutation. *Journal of Integer Sequences, 18*(6). https://cs.uwaterloo.ca/journals/JIS/VOL18/Sloane/sloane9.pdf