

Re: Whats with this sequence?

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Danny wrote:

This sequence is the difference of each triangle number and the corresponding Fibonacci number.

e.g.

Starting with the first triangle number and the first Fibonacci $f(1)$ number --

$t - f = \text{difference}$

$$1 - 1 = 0$$

$$3 - 1 = 2$$

$$6 - 2 = 4$$

$$10 - 3 = 7$$

$$15 - 5 = 10$$

etc.

Gives this resulting sequence --

0,2,4,7,10,13,15,15,11,0,-23,-66,-142,-272,
-490,-851,-1444,-2413,...

Note: the 10th term (0) which is $55 - 55 = t(10) - f(10) = 0$.

All fine and good but, why on the third delta row beneath this sequence the Fibonacci sequence appears?

Except for the leading 1,1 the 3rd delta sequence is the Fibonacci sequence excluding the double entry of [1,1] at the beginning the following starts after the [1,1] --
0,1,1,2,3,5,8,13,21,34,55,89,144...

It just seems strange that this sequence would produce the Fibonacci sequence in one of its deltas!

Also why did it not list the triangle numbers instead on say the same or some other delta row?

You could have worked this out. The 3rd deltas are the Fibonacci numbers because they are the deltas of your initial sequence of (triangles minus Fibonacci), which are the (deltas of triangles) minus (deltas of Fibonacci).

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Now the 3rd deltas of triangles are zero, and the deltas of Fibonacci are Fibonacci all over again, so what you spotted was not strange at all, it was inevitable.

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