

Alg2.1 Family Support Material

Main ideas in this unit

In this unit, your student will be remembering ways to represent functions. In mathematics, we can think of a function as a rule that tells us how to go from an input to an output. A *sequence* is a special type of function in which the input is a position in a list, and the output is the number in that position. If you have ever used “fill down” to continue a pattern in a spreadsheet, you have created a sequence. For each sequence of numbers, can you guess a possible rule for creating the next number?

Sequence A: 4, 7, 10, 13,

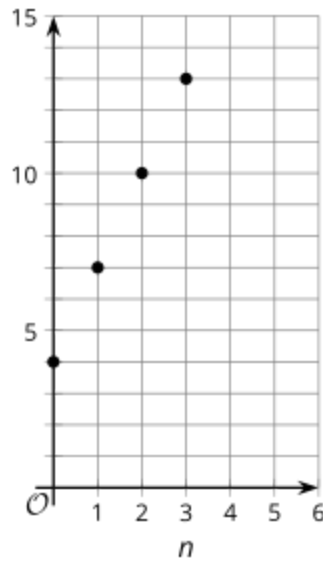
Sequence B: 2, 6, 18, 54,

You probably noticed that a rule for Sequence A could be “add 3 to any term to get the next term.” There are different ways we could represent this sequence.

Using a table:

| | | | | | |
|-------------------------|---|---|----|----|------------------|
| position in list | 0 | 1 | 2 | 3 | n |
| term | 4 | 7 | 10 | 13 | $4 + 3 \times n$ |

Using a graph:



Using words:

“To find the n th term, multiply n by 3 and add 4.”

Using notation for defining a function:

$f(n) = 4 + 3 \times n$ (the value of the n th term is $4 + 3 \times n$). For example, $f(2) = 4 + 3 \times 2$, so $f(2) = 10$ (the value of the 2nd term is 10).

Here is a task to try with your student:

Let's revisit Sequence B: 2, 6, 18, 54, . . .

1. Describe any patterns you notice.
2. If the pattern is “multiply any term by 3 to get the next term,” what is the next term?
3. If we call 2 the “0th term,” what is the 10th term?
4. How could we express the n th term?
5. Represent Sequence B in as many different ways as you can.

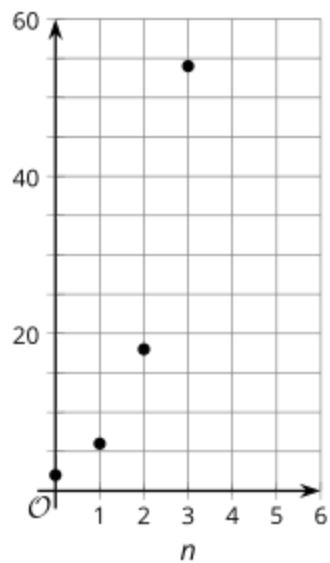
Solution

1. It is possible to describe many patterns in this list.
2. 162
3. 118,098
4. 2×3^n . This can also be written $2(3^n)$ or $2 \cdot 3^n$.
5. Here are some ways:

1. **position in list**

term

| | | | | |
|---|---|----|----|-----|
| 0 | 1 | 2 | 3 | n |
| 2 | 6 | 18 | 54 | |



"Multiply any term by 3 to get the next term."

$$f(n) = 2 \times 3^n$$

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