Example 1 – Here is a table from Augustus Gloop's dad's deal.

List out the number of candies that Augustus will get each day get as a sequence.

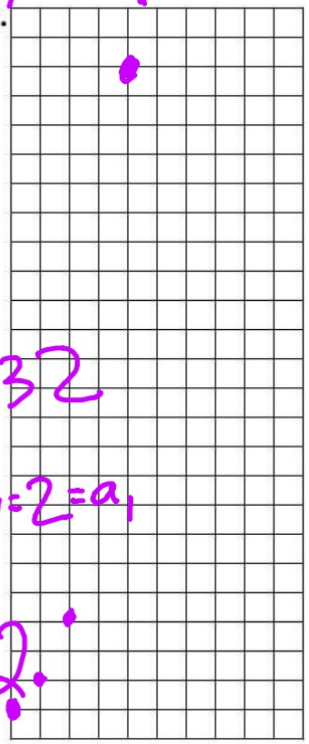
Day	Candies
0	1
1	2
2	4
3	8
4	16
5	32
6	64

$\{1, 2, 4, 8, 16, 32, 64\}$

What do you do to calculate the number of candy received on the next day?

double ×2

Graph the sequence on the graphing grid.



Calculate the number of candies Augustus would get on day 25. How did you calculate it?

$f(x) = 2^x = 2^{25}$

33554432

Recursive Formulas –

$a_n = a_{n-1} \cdot 2, \; a_0 = 1$

$a_1 = a_{1-1} \cdot 2 = a_0 \cdot 2 = (1)(2) = 2 = a_1$

Explicit Formulas –

$f(n) = 1 \cdot 2^n$

$f(1) = 1 \cdot 2^1 = 2$

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Example 2 – Here is a table from Augustus Gloop's mom's deal.

List out the number of candies that Augustus will get each day get as a sequence.

Day	Candies
0	0
1	20
2	40
3	60
4	80
5	100
6	120

$\{0, 20, 40, 60, 80, 100, 120\}$

What do you do to calculate the number of candy received on the next day?

$f(x) = 20x$

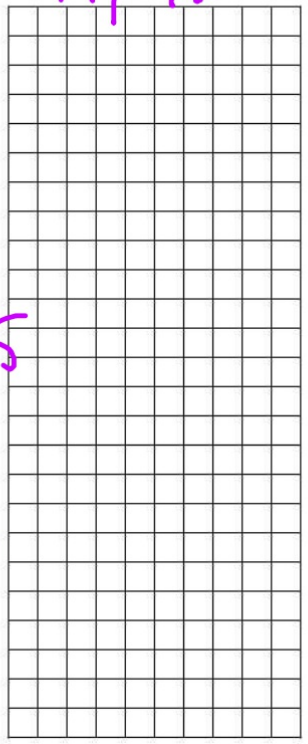
Calculate the number of candies Augustus would get on day 25. How did you calculate it?

$f(n) = 20n \quad n = 25$

$f(n) = 20n$

$f(25) = 20(25)$

500



Example 3 – Complete the sequence by using recursion.

$A = \{5, 9, 13, 17, a_5, a_6, 29, 33, 37, a_{10}\}$

What are the fifth, sixth, and tenth terms of the sequence?

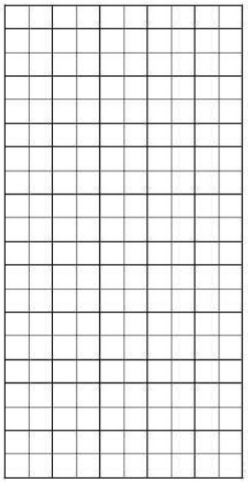
$a_n = a_{n-1} + 4$

$a_5 = a_{5-1} + 4$

$a_5 = a_4 + 4 = 17 + 4 = 21$

$a_5 = 21$, $a_6 = 25$, $a_{10} = 41$

~~Graph the Sequence.~~



Example 4 – Find the missing terms in the sequence using recursion.

$B = \{6, 18, 54, 162, b_5, b_6, 4374, b_8\}$

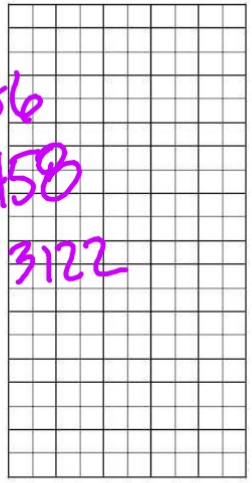
$162 \cdot 3$

$b_5 = 486$, $b_6 = 1458$, $b_8 = 13122$

$b_5 = b_{5-1} \cdot 3$

$b_5 = b_4 \cdot 3 = 162(3)$

~~Graph the Sequence.~~



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Example 5 – What is the fourth term in the sequence given by $f(n) = 3n - 7$?

$f(4) = 3(4) - 7 = 12 - 7 = 5$

Example 6 – Write the first four terms of the following sequences.

A. $a_n = a_{n-1} - 5$; $a_0 = -3$

$a_1 = a_{1-1} - 5$

$a_1 = a_0 - 5$

$a_1 = -3 - 5 = -8$

$a_2 = a_{2-1} - 5$

$a_2 = a_1 - 5$

$a_2 = -8 - 5 = -13$

$a_1 = -8$, $a_2 = -13$, $a_3 = -18$, $a_4 = -23$

B. $a_n = -3[a_{n-1}]$; $a_0 = 2$

$a_1 = -3[a_{1-1}]$

$a_1 = -3(a_0)$

$a_1 = -3(2) = -6$

$a_2 = -3(a_{2-1})$

$a_2 = -3(a_1)$

$a_2 = -3(-6)$

$a_1 = -6$, $a_2 = 18$, $a_3 = -54$, $a_4 = 162$

$a_3 = -3(a_{3-1})$

$a_3 = -3(a_2)$

$a_3 = -3(18) =$

C. $f(n) = 1200\left(\frac{1}{4}\right)^n$

$f(n) = 1200\left(\frac{1}{4}\right)^n$

$f(1)$ $f(2)$ $f(3)$ $f(4)$

Example 7 – Find the fifth term of a sequence when…

$a_n = 4[a_{n-1}]$; $a_3 = 25$

$a_4 = 100$. a_5

$a_4 = 4[a_{4-1}]$

$a_5 = 4(a_{5-1})$

$a_4 = 4(a_3) = 4(25) = 100 = 4(a_4)$

$4(100) = 400$