

What's the Equation?

Classroom:

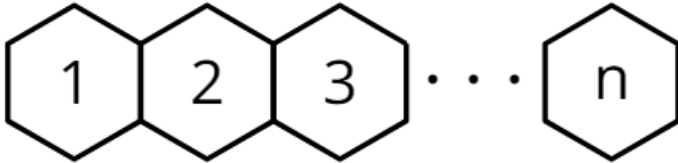
Due:

Student Name:

Date Submitted:

Problem 1

A party will have hexagonal tables placed together with space for one person on each open side:



Complete this table showing the number of people $P(n)$ who can sit at n tables. Find the value of each labeled cell in the table.

n	1	2	3	4	5
$P(n)$	6	A	B	C	D

1) Cell A

2) Cell B

3) Cell C

4) Cell D

5) Describe how the number of people who can sit at the tables changes with each step.

6) Explain why $P(3.2)$ does not make sense in this scenario.

7) Define P recursively.

8) Define P for the n^{th} term.

What's the Equation?

Problem 2

Diego is making a stack of pennies. He starts with 5 and then adds them 1 at a time. A penny is 1.52 mm thick.

Complete the table with the height of the stack $h(n)$, in mm, after n pennies have been added. Find the value of each labeled cell in the table.

n	$h(n)$
0	7.6
1	A
2	B
3	C

9) Cell A

10) Cell B

11) Cell C

12) Does $h(1.52)$ make sense?

True or false? Write below.

13) Explain how you know.

Problem 3

A piece of paper has an area of 80 square inches. A person cuts off $\frac{1}{4}$ of the piece of paper. Then a second person cuts off $\frac{1}{4}$ of the remaining paper. A third person cuts off $\frac{1}{4}$ what is left, and so on.

Complete the table where $A(n)$ is the area, in square inches, of the remaining paper after the n^{th} person cuts off their fraction. Find the value of each labeled cell in the table.

n	$A(n)$
0	80
1	A
2	B
3	C

14) Cell A

15) Cell B

16) Cell C

What's the Equation?

17) Define A for the n^{th} term.

18) What is a reasonable domain for the function A ?

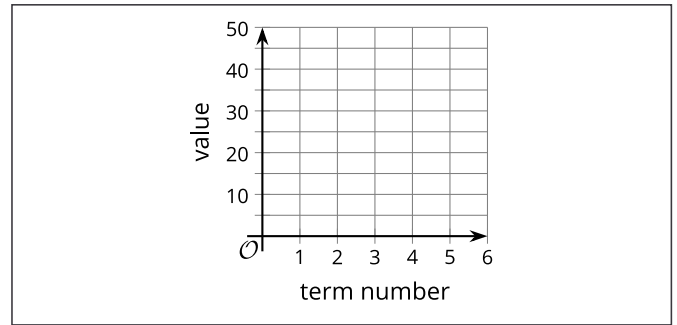
19) Explain how you know.

Problem 4

Here is the recursive definition of a sequence: $f(1)=35$, $f(n)=f(n-1)-8$ for $n \geq 2$.

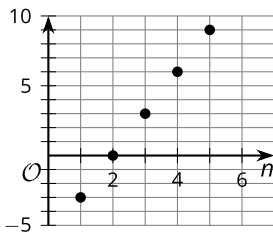
20) List the first 5 terms of the sequence.

21) Graph the value of each term as a function of the term number.



Problem 5

22) Here is a graph of sequence q . Define q recursively using function notation.



Problem 6

Here is a recursive definition for a sequence f : $f(0)=19$, $f(n)=f(n-1)-6$ for $n \geq 1$. The definition for the n^{th} term is $f(n)=19-6 \cdot n$ for $n \geq 0$.

What's the Equation?

23) Explain how you know that these definitions represent the same sequence.

24) Select a definition to calculate $f(20)$.

25) Which definition did you use?

26) Explain why you chose it.

Problem 7

27) An arithmetic sequence j starts 20, 16, . . . Explain how you would calculate the value of the 500th term.