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## **Curated Practice Problem Set**

## **Unit 1 Lesson 9 Cumulative Practice Problems**

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



a. Complete this table showing the number of people P(n) who can sit at *n* tables.

n	1	2	3	4	5
P(n)	6				

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

c. Explain why *P*(3.2) does not make sense in this scenario.

d. Define *P* recursively and for the  $n^{\text{th}}$  term.

- 2. Diego is making a stack of pennies. He starts with 5 and then adds them 1 at at time. A penny is 1.52 mm thick.
  - a. Complete the table with the height of the stack h(n), in mm, after n pennies have been added.
  - b. Does *h*(1.52) make sense? Explain how you know.

n	h(n)
0	7.6
1	
2	
3	



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- 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.
  - a. Complete the table where *A(n)* is the area, in square inches, of the remaining paper after the *n<sup>th</sup>* person cuts off their fraction.
    b. Define *A* for the *n<sup>th</sup>* term.
  - c. What is a reasonable domain for the function *A*? Explain how you know.

n	A(n)
0	80
1	
2	
3	

- 4. Here is the recursive definition of a sequence: f(1) = 35, f(n) = f(n 1) 8 for  $n \ge 2$ .
  - a. List the first 5 terms of the sequence.
  - b. Graph the value of each term as a function of the term number.



(From Unit 1, Lesson 7.)



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5. Here is a graph of sequence *q*. Define *q* recursively using function notation.



(From Unit 1, Lesson 6.)

- 6. Here is a recursive definition for a sequence f: f(0) = 19, f(n) = f(n 1) 6 for  $n \ge 1$ . The definition for the  $n^{\text{th}}$  term is  $f(n) = 19 - 6 \bullet n$  for  $n \ge 0$ .
  - a. Explain how you know that these definitions represent the same sequence.

b. Select a definition to calculate f(20), and explain why you chose it.

(From Unit 1, Lesson 8.)

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

(From Unit 1, Lesson 8.)