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Assessment

End of Unit Assessment

You may use a scientific calculator.

1. Which formula defines the sequence $f(1) = 2, f(2) = 6, f(3) = 10, f(4) = 14, f(5) = 18$?

   a. $f(1) = 2, f(n) = 6 + f(n-1)$ for $n \geq 1$

   b. $f(1) = 2, f(n) = 4 + f(n-1)$ for $n \geq 1$

   c. $f(1) = 2, f(n) = 2 + f(n-1)$ for $n \geq 1$

   d. $f(1) = 6, f(n) = 4 + f(n-1)$ for $n \geq 1$

2. A sequence is defined by $f(1) = 3$ and $f(n) = 2 \cdot f(n-1)$ for $n \geq 1$. Which of the following statements defines the n^{th} term of f?

   a. $f(n) = 3 + 2(n-1)$ for $n \geq 1$

   b. $f(n) = 3 + 2n$ for $n \geq 1$

   c. $f(n) = 3 \cdot 2^{n-1}$ for $n \geq 1$

   d. $f(n) = 3 \cdot 2^{n}$ for $n \geq 1$

3. Here is a growing pattern of squares:

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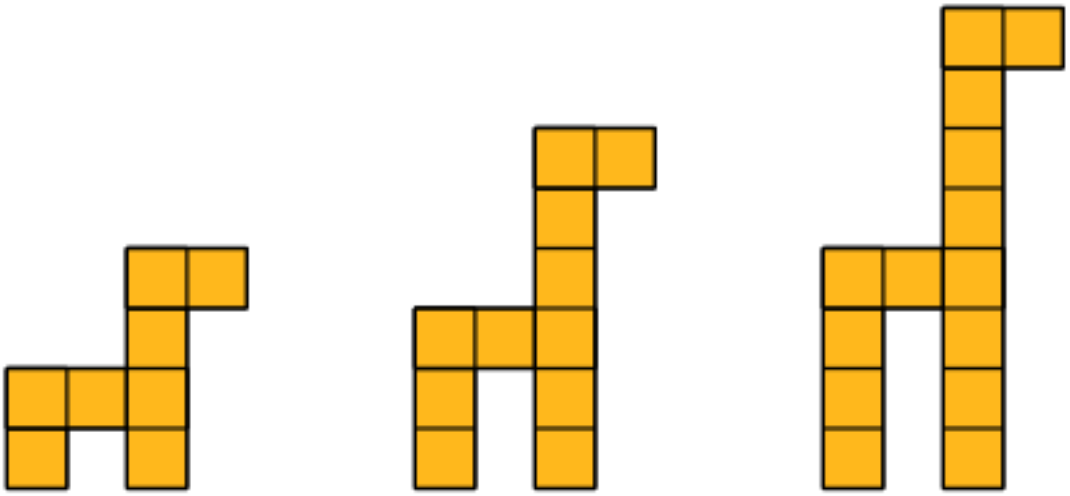

4.

5. Select **all** the expressions that represent the number of squares in Step n.

   a. $f(n) = 8 + 3(n - 1)$ for $n \geq 1$

   b. $f(n) = 3 + 8(n - 1)$ for $n \geq 1$

   c. $f(1) = 8, f(n) = 3 + f(n - 1)$ for $n \geq 2$

   d. $f(1) = 8, f(n) = 8 + f(n - 1)$ for $n \geq 2$

   e. $f(n) = 3 + 8n$ for $n \geq 1$

   f. $f(n) = 3n + 5$ for $n \geq 1$

6. Here are some values of sequence Q. Write a recursive definition for the sequence.

7. n	8. $Q(n)$
9. 1	10. 3
11. 3	12. 8
13. 7	14. 18

15.

16.

17. A piece of paper has an area of 81 cm^2. A strip is cut off that is $\frac{1}{3}$ the original area. From that strip, another strip is cut off that is $\frac{1}{3}$ the area of the first, and so on.

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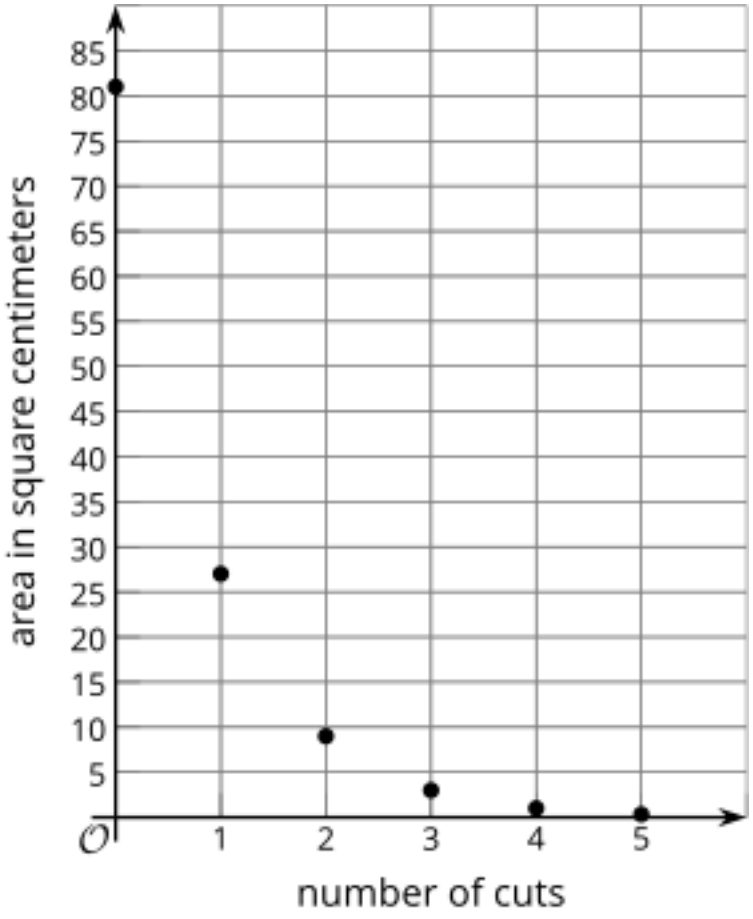
18. Here is a graph and table representing sequence k, where $k(n)$ is the area in square centimeters of the strip of paper after n cuts.



19.

20.

21. number of cuts	22. area in square centimeters
23. 0	24. 81
25. 1	26. 27
27. 2	28. 9
29. 3	30. 3
31. 4	32. 1

a. Is sequence k geometric or arithmetic? Explain how you know.

b. Write an equation to define sequence k recursively.

c. For term $k(a)$, what are some values of a that make sense to use? What are some values of a that don't make sense to use? Explain your reasoning.

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33. The first two numbers in a sequence h are $h(1) = 2$ and $h(2) = 6$.

    a. If h is an arithmetic sequence, write a definition for the n^{th} term of h. Explain or show your reasoning.

    b. If h is a geometric sequence, write a definition for the n^{th} term of h. Explain or show your reasoning.

34. Here are two sequences:

35. Sequence A

36. term number	37. value
38. 0	39. $\frac{1}{4}$
40. 1	41. $\frac{1}{2}$
42. 2	43. 1
44. 3	45. 2
46. 4	47. 4

48. Sequence B

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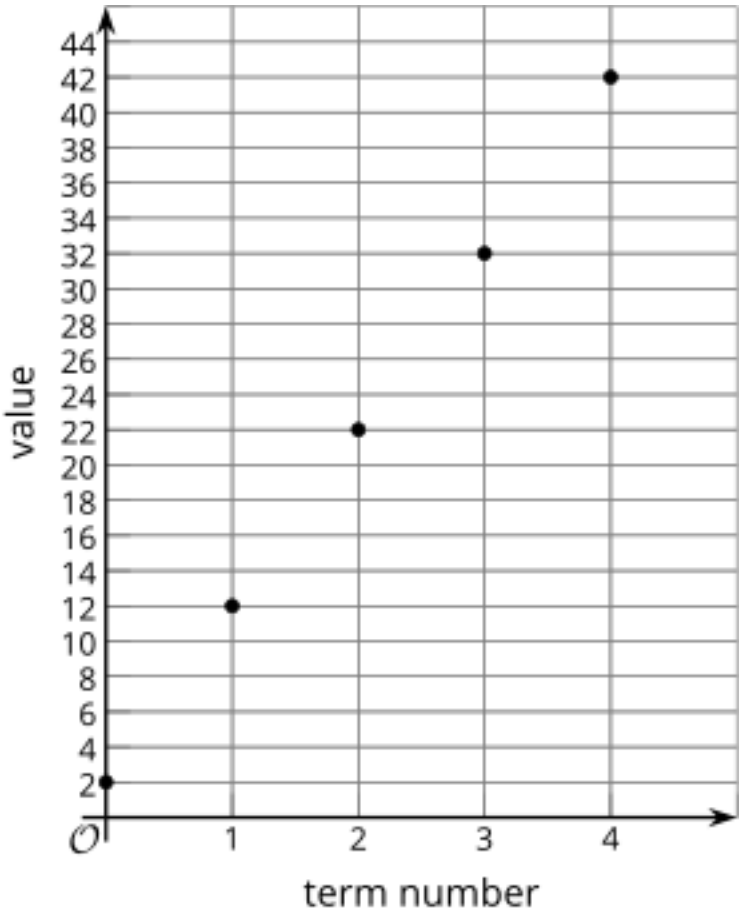

49.

50.

a. For sequence A, describe a way to produce each new term from the previous term.

b. For sequence B, describe a way to produce each new term from the previous term.

c. Write a definition for the n^{th} term of sequence A.

d. Write a definition for the n^{th} term of sequence B.

e. If these sequences continue, then which is greater, $A(9)$ or $B(9)$? Explain or show how you know.