BECA/Huson/Precalculus: Sequences First and last name:
17 September 2024 Section:

1.10 Pretest: Powers and radicals, sequences

1. Memorize the single digit powers. *3.OA.7 Fluently multiply and divide within 100*

   (a) $9^2 =$

   (b) $8^2 =$

   (c) $2^2 =$

   (d) $7^2 =$

   (e) $5^2 =$

   (f) $4^3 =$

2. Memorize the square roots of whole numbers through 100 and cubes through five.

   (a) $\sqrt{9} =$

   (b) $\sqrt{47} =$

   (c) $\sqrt{64} =$

   (d) $\sqrt{36} =$

   (e) $\sqrt[3]{8} =$

   (f) $\sqrt[3]{27} =$

3. Simplify each expression by "collecting like terms"

   (a) $2x + 4 - x + 11$

   (b) $5y - 4 - 7y + y$

   (c) $14 + 5\pi - 2\pi + 4$

   (d) $2a - 7a + 3\sqrt{5} + \sqrt{5}$

4. Which sequence is defined recursively?

   (a) $a_n = 3n + 1$

   (b) $a_1 = 2$ and $a_{n+1} = a_n + 3$

   (c) $a_n = 4n - 5$

   (d) $a_n = 2^n$

5. The first term of a sequence is $a_1 = 7$ and each subsequent term is found by adding 5 to the previous term. Which formula represents the nth term of the sequence?

   (a) $a_n = 5n + 2$

   (b) $a_n = 5n + 7$

   (c) $a_n = 5n - 3$

   (d) $a_n = 7n + 5$

6. A sequence is defined recursively by $a_1 = 2$ and $a_{n+1} = 3a_n + 1$ for $n \geq 1$. Find the first four terms of the sequence.

7. Given the arithmetic sequence where $a_1 = 5$ and the common difference $d = 3$, write an explicit formula for the nth term of the sequence. What is the 10th term?

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8. A recursive formula for the sequence $40, 30, 22.5, \ldots$ is

   (a) $g_n = 40\left(\frac{3}{4}\right)^n$

   (b) $g_1 = 40$
   $g_n = g_{n-1} - 10$

   (c) $g_n = 40\left(\frac{3}{4}\right)^{n-1}$

   (d) $g_1 = 40$
   $g_n = \frac{3}{4}g_{n-1}$

9. Write a recursive formula for the sequence $5, 10, 15, 20, \ldots$

10. Savannah just got contact lenses. Her doctor said she can wear them 2 hours the first day, and can then increase the length of time by 30 minutes each day. If this pattern continues, which formula would not be appropriate to determine the length of time, in either minutes or hours, she could wear her contact lenses on the nth day?

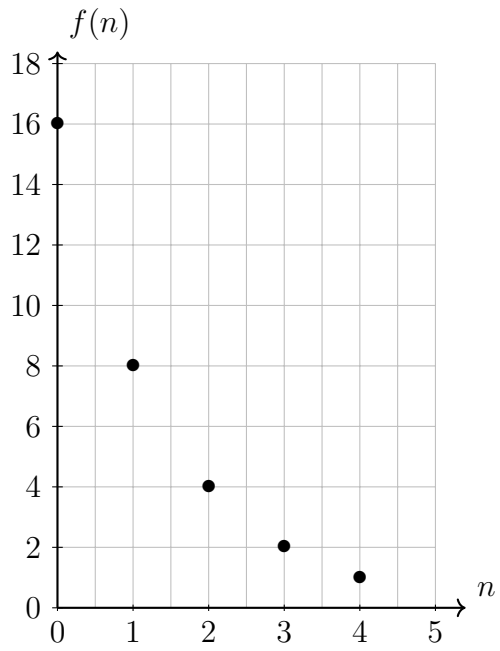
    (a) $t_n = 120 + 30(n-1)$

    (b) $t_n = 2 + 0.5(n-1)$

    (c) $t_n = 2 + 30n$

    (d) $t_n = 120 + 0.5(n-1)$

11. A sequence f is shown below as a graph and as a table.



n	$f(n)$
0	16
1	8
2	4
3	2
4	1

(a) Is sequence f geometric or arithmetic? Explain how you know.

(b) Write an equation to define sequence f recursively.

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