THIRD SPACE LEARNING

Recursive Formula Worksheet

Algebra

Grades 9 to 12

Questions

Name: .....

Date: .....

1 A sequence is defined by the recursive formula $a_{n+1} = a_n - 7$ with $a_0 = 50$.
Find the next four terms of the sequence.

Answer

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2 A sequence is defined recursively by $a_{n+1} = 3a_n$ with $a_0 = 2$.
Find the next four terms of the sequence.

Answer

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3 A population of bacteria doubles every hour, starting at 100 bacteria.
Write a recursive formula for this situation.

Answer

---

4 A company's profits decrease by $500 each year. Write a recursive formula to represent the sequence, assuming the first year's profit was $12,000.

Answer

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5 A sequence is defined by the recursive formula $a_{n+1} = 1.5a_n$ with $a_0 = 4$.
Find the value of a_3.

Answer

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6 A savings account starts with $1,000 and grows by $100 each month. Write a recursive formula to model this situation.

Answer

7 A sequence starts with $a_0 = 5$, and each term is 3 less than the previous term. Write the first five terms of the sequence.

Answer

8 Write a recursive formula for the arithmetic sequence: 7, 13, 19, 25, 31,...

Answer

9 Write a recursive formula for the geometric sequence: 6; 180; 5,400; 162,00...

Answer

10 Given the recursive formula $a_{n+1} = a_n + 44.5$ with $a_0 = 10$, find the 5th term.

Answer

11 Find the first four terms of the sequence defined recursively by $a_{n+1} = -12a_n$ with $a_0 = 3$.

Answer

12 A sequence is defined as $a_0 = -1, a_{n+1} = 0.5a_n$. Write the first five terms of the sequence.

Answer

13 Write a recursive formula for the arithmetic sequence: 5.6, 10.1, 14.6, 18.1,...

Answer

14 Write a recursive formula for the geometric sequence: 10, -5, 2.5, -1.25,...

Answer

15 A sequence starts at $a_0 = \frac{2}{3}$ and grows by multiplying each term by 4. Write the first five terms of the sequence.

Answer

16 A sequence is defined as $a_0 = 50$, $a_{n+1} = 0.8a_n$. What is the 4th term?

Answer

17 A sequence begins with $a_0 = 12$, and each term decreases by $\frac{4}{5}$.
Write a recursive formula for the sequence.

Answer

18 Find the recursive formula for the geometric sequence 100, 25, 6.25, 1.5625,...

Answer

19 Write the recursive formula for the arithmetic sequence: -3, -7.5, -12, -16.5,...

Answer

20 A sequence is defined by $a_0 = 5$, $a_{n+1} = -\frac{1}{3}a_n$. Find the first four terms.

Answer

Answers

Question number	Question	Answers	Standard
1	A sequence is defined by the recursive formula $a_{n+1} = a_n - 7$ with $a_0 = 50$. Find the next four terms of the sequence.	43, 36, 29, 22	HSF.BF.A.1
2	A sequence is defined recursively by $a_{n+1} = 3a_n$ with $a_0 = 2$. Find the next four terms of the sequence.	6, 18, 54, 162	HSF.BF.A.1
3	A population of bacteria doubles every hour, starting at 100 bacteria. Write a recursive formula for this situation.	$a_0 = 100, a_{n+1} = 2a_n$	HSF.BF.A.1
4	A company's profits decrease by $500 each year. Write a recursive formula to represent the sequence, assuming the first year's profit was $12,000.	$a_0 = 12000, a_{n+1} = a_n - 500$	HSF.BF.A.1
5	A sequence is defined by the recursive formula $a_{n+1} = 1.5a_n$ with $a_0 = 4$. Find the value of a_3.	13.5	HSF.BF.A.1
6	A savings account starts with $1,000 and grows by $100 each month. Write a recursive formula to model this situation.	$a_0 = 1000, a_{n+1} = a_n + 100$	HSF.BF.A.1

Recursive Formula Worksheet | Grades 9 to 12 | Answers

Question number	Question	Answers	Standard
7	A sequence starts with $a_0 = 5$, and each term is 3 less than the previous term. Write the first five terms of the sequence.	5, 2, -1, -4, -7	HSF.BF.A.1
8	Write a recursive formula for the arithmetic sequence: 7, 13, 19, 25, 31,...	$a_0 = 7, a_{n+1} = a_n + 6$	HSF.BF.A.2
9	Write a recursive formula for the geometric sequence: 6; 180; 5,400; 162,00...	$a_0 = 6, a_{n+1} = 30a_n$	HSF.BF.A.2
10	Given the recursive formula $a_{n+1} = a_n + 44.5$ with $a_0 = 10$, find the 5th term.	232.5	HSF.BF.A.2
11	Find the first four terms of the sequence defined recursively by $a_{n+1} = -12a_n$ with $a_0 = 3$.	3; -36; 432; -5,184	HSF.BF.A.2
12	A sequence is defined as $a_0 = -1, a_{n+1} = 0.5a_n$. Write the first five terms of the sequence.	-1, -0.5, -0.25, -0.125, -0.0625	HSF.BF.A.2
13	Write a recursive formula for the arithmetic sequence: 5.6, 10.1, 14.6, 18.1,...	$a_0 = 5.6, a_{n+1} = a_n + 4.5$	HSF.BF.A.2
14	Write a recursive formula for the geometric sequence: 10, -5, 2.5, -1.25,...	$a_0 = 10, a_{n+1} = -0.5a_n$	HSF.BF.A.2
15	A sequence starts at $a_0 = \frac{2}{3}$ and grows by multiplying each term by 4. Write the first five terms of the sequence.	$\frac{2}{3}, \frac{8}{3}, \frac{32}{3}, \frac{128}{3}, \frac{512}{3}$	HSF.BF.A.2

Question number	Question	Answers	Standard
16	A sequence is defined as $a_0 = 50$, $a_{n+1} = 0.8a_n$. What is the 4th term?	20.48	HSF.LE.A.2
17	A sequence begins with $a_0 = 12$, and each term decreases by $\frac{4}{5}$. Write a recursive formula for the sequence.	$a_0 = 12, a_{n+1} = a_n - \frac{4}{5}$	HSF.LE.A.2
18	Find the recursive formula for the geometric sequence 100, 25, 6.25, 1.5625,...	$a_0 = 100, a_{n+1} = 0.25a_n$	HSF.LE.A.2
19	Write the recursive formula for the arithmetic sequence: -3, -7.5, -12, -16.5,...	$a_0 = 3, a_{n+1} = a_n - 4.5$	HSF.LE.A.2
20	A sequence is defined by $a_0 = 5, a_{n+1} = -\frac{1}{3}a_n$. Find the first four terms.	5, $-\frac{5}{3}$, $\frac{5}{9}$, $-\frac{5}{27}$	HSF.LE.A.2

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