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The Power of Algebra Is a Curious Thing Using Formulas to Determine Terms of a Sequence

Vocabulary

Choose the term that best completes each statement.

index explicit formula recursive formula

1. $A(n)$ _____ expresses each term of a sequence based on the preceding term of the sequence.
2. The _____ is the position of a term in a sequence.
3. $A(n)$ _____ calculates each term of a sequence using the term's position in the sequence.

Problem Set

Determine each unknown term in the given arithmetic sequence using the explicit formula.

- | | |
|---|--|
| <p>1. Determine the 20th term of the sequence 1, 4, 7, ...</p> $a_n = a_1 + d(n - 1)$ $a_{20} = 1 + 3(20 - 1)$ $a_{20} = 1 + 3(19)$ $a_{20} = 1 + 57$ $a_{20} = 58$ | <p>2. Determine the 30th term of the sequence -10, -15, -20, ...</p> |
| <p>3. Determine the 25th term of the sequence 3.3, 4.4, 5.5, ...</p> | <p>4. Determine the 50th term of the sequence 100, 92, 84, ...</p> |



5. Determine the 42nd term of the sequence
12.25, 14.50, 16.75, ...

6. Determine the 28th term of the sequence
-242, -251, -260, ...

7. Determine the 34th term of the sequence
-76.2, -70.9, -65.6, ...

8. Determine the 60th term of the sequence
10, 25, 40, ...

9. Determine the 57th term of the sequence
672, 660, 648, ...

10. Determine the 75th term of the sequence
-200, -100, 0, ...

Determine each unknown term in the given geometric sequence using the explicit formula. Round the answer to the nearest hundredth when necessary.

11. Determine the 10th term of the sequence
3, 6, 12, ...

$$g_n = g_1 \cdot r^{n-1}$$

$$g_{10} = 3 \cdot 2^{10-1}$$

$$g_{10} = 3 \cdot 2^9$$

$$g_{10} = 3 \cdot 512$$

$$g_{10} = 1536$$

12. Determine the 15th term of the sequence
1, -2, 4, ...

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13. Determine the 12th term of the sequence
5, 15, 45, ...
14. Determine the 16th term of the sequence
9, 18, 36, ...
15. Determine the 20th term of the sequence
0.125, -0.250, 0.500, ...
16. Determine the 18th term of the sequence
3, 9, 27, ...
17. Determine the 14th term of the sequence
-4, 8, -16, ...
18. Determine the 10th term of the sequence
0.1, 0.5, 2.5, ...
19. Determine the 12th term of the sequence
4, 5, 6.25, ...
20. Determine the 10th term of the sequence
5, -25, 125, ...

Determine whether each sequence is arithmetic or geometric. Then, use the appropriate recursive formula to determine the unknown term(s) in the sequence.

21. 4, 8, 16, 32, $\overset{64}{\rule{1.5cm}{0.4pt}}$, ...

The sequence is geometric.

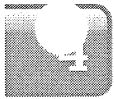
$$g_n = g_{n-1} \cdot r$$

$$g_5 = g_4 \cdot 2$$

$$g_5 = 32 \cdot 2$$

$$g_5 = 64$$

22. 16, 30, 44, 58, $\rule{1.5cm}{0.4pt}$, ...



23. 2, -6, 18, $\rule{1.5cm}{0.4pt}$, 162, $\rule{1.5cm}{0.4pt}$, ...

24. 7.3, 9.4, 11.5, $\rule{1.5cm}{0.4pt}$, 15.7, $\rule{1.5cm}{0.4pt}$, ...

25. 320, 410, 500, $\rule{1.5cm}{0.4pt}$, $\rule{1.5cm}{0.4pt}$, ...

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26. 7, 21, 63, _____, 567, _____, ...

27. -68, -83, -98, _____, _____, _____, ...

28. -5, 20, -80, _____, _____, _____, ...

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Determine the unknown term in each arithmetic sequence using a graphing calculator.

29. Determine the 20th term of the sequence
30, 70, 110, ...

$$a_{20} = 790$$

30. Determine the 25th term of the sequence
-25, -50, -75, ...

31. Determine the 30th term of the sequence
16, 24, 32, ...

32. Determine the 35th term of the sequence
120, 104, 88, ...

33. Determine the 30th term of the sequence
350, 700, 1050, ...
34. Determine the 22nd term of the sequence
0, -45, -90, ...
35. Determine the 24th term of the sequence
6.8, 9.5, 12.2, ...
36. Determine the 36th term of the sequence
189, 200, 211, ...
37. Determine the 20th term of the sequence
2500, 3100, 3700, ...
38. Determine the 50th term of the sequence
-97, -94, -91, ...

