

Arithmetic Sequences as Linear Functions

Algebra 1 • Section 4.5

Name: _____

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Score: _____ / 12

Quick Review and Helpful Hints

A function pairs each input with exactly one output. Pay attention to what the input means, what rule is being applied, and whether the question asks for a value, a rule, a domain, or an interpretation.

▷ **Example:** For $f(x) = 2x + 5$, find $f(4)$.

Work: Replace x with 4: $f(4) = 2(4) + 5 = 13$.

★ **Answer:** 13

◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

- | | | | |
|--|-------|---|-------|
| 1. Find the next three terms: 5, 9, 13, ... | _____ | 6. Find a_8 if $a_1 = 12$ and $d = -3$. | _____ |
| 2. Find a_n for 7, 10, 13, ... | _____ | 7. Write a recursive rule for 9, 14, 19, ... | _____ |
| 3. Find the 12th term of 4, 11, 18, ... | _____ | 8. Which term of 3, 8, 13, ... is 48? | _____ |
| 4. Is 2, 6, 12, 20, ... arithmetic? | _____ | 9. Find a_n if $a_1 = -2$ and $d = 6$. | _____ |
| 5. Find the common difference in 31, 26, 21, 16, ... | _____ | 10. Find the missing term: 4, __, 18 in an arithmetic sequence. | _____ |

◆ Word Problems

11. A gym membership starts at \$30 and adds \$12 each month. Write the cost after n months. _____
12. A theater has 18 seats in row 1 and each row has 4 more seats. How many in row 9? _____



Answer Keys

- | | |
|---|--|
| <p>1. <input type="text" value="17, 21, 25"/></p> <p>2. <input type="text" value="a_n = 3n + 4"/></p> <p>3. <input type="text" value="81"/></p> <p>4. <input type="text" value="No"/></p> <p>5. <input type="text" value="-5"/></p> <p>6. <input type="text" value="-9"/></p> | <p>7. <input type="text" value="a_1 = 9; a_n = a_{n-1} + 5"/></p> <p>8. <input type="text" value="10th"/></p> <p>9. <input type="text" value="a_n = 6n - 8"/></p> <p>10. <input type="text" value="11"/></p> <p>11. <input type="text" value="a_n = 12n + 18"/></p> <p>12. <input type="text" value="50"/></p> |
|---|--|

Step-by-Step Explanations

1. Each term jumps up by 4, so just keep adding 4 to ride the pattern forward.
2. Start at 7, step by 3: $7 + 3(n - 1)$ tidies up into $3n + 4$.
3. From 4, you take 11 steps of 7 to reach term 12: $4 + 11(7) = 81$.
4. The gaps are 4, 6, 8 — they keep growing, and arithmetic sequences need the same gap every time.
5. The terms are shrinking by 5 each step, so the difference is negative: -5 .
6. From the start, term 8 is 7 steps away: $12 + 7(-3)$ drops you to -9 .
7. Recursive just means 'use the term before.' Begin at 9, then each term is the last one plus 5.
8. Set $3 + 5(n - 1) = 48$. That gives $5(n - 1) = 45$, so $n = 10$ — the 10th spot holds 48.
9. Plug into the pattern: $-2 + 6(n - 1)$ simplifies neatly to $6n - 8$.
10. The middle of an arithmetic trio is just the average of its neighbors: $(4 + 18)/2 = 11$.
11. Month 1 already costs 30, then 12 piles on each month: $30 + 12(n - 1) = 12n + 18$.
12. Row 9 is 8 rows past the first, gaining 4 seats each step: $18 + 4(8) = 50$.



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