Arithmetic Sequences as Linear Functions

Algebra 1 •Section 4.5

Name: _____	Date: _____	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: $5, 9, 13, \ldots$.

2. Find a_n for $7, 10, 13, \ldots$.

3. Find the 12th term of $4, 11, 18, \ldots$.

4. Is $2, 6, 12, 20, \ldots$ arithmetic?

5. Find the common difference in $31, 26, 21, 16, \ldots$.

6. Find a_8 if $a_1 = 12$ and $d = -3$.

7. Write a recursive rule for $9, 14, 19, \ldots$.

8. Which term of $3, 8, 13, \ldots$ is 48?

9. Find a_n if $a_1 = -2$ and $d = 6$.

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

1. $\boxed{17, 21, 25}$
2. $\boxed{a_n = 3n + 4}$
3. $\boxed{81}$
4. $\boxed{\text{No}}$
5. $\boxed{-5}$
6. $\boxed{-9}$
7. $\boxed{a_1 = 9; a_n = a_{n-1} + 5}$
8. $\boxed{10\text{th}}$
9. $\boxed{a_n = 6n - 8}$
10. $\boxed{11}$
11. $\boxed{a_n = 12n + 18}$
12. $\boxed{50}$

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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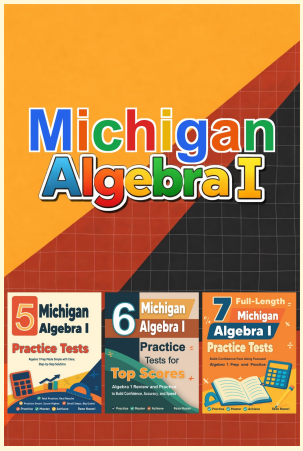

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