Name _____ Date _____

Arithmetic Sequences as Linear Functions

Directions: In every sequence here, the first term is term 1, written a(1) or s(1). Use the terms, rule or situation in each question to answer it.

1. Each list is the start of an arithmetic sequence whose first number is term 1. Match each sequence to its explicit rule.

Write the letter of the matching answer on each line.

1. _____ 4, 7, 10, 13, ...
2. _____ 7, 4, 1, −2, ...
3. _____ 3, 7, 11, 15, ...
4. _____ −2, 1, 4, 7, ...

A. $a(n) = 7 - 3(n - 1)$
B. $a(n) = -2 + 3(n - 1)$
C. $a(n) = 3 + 7(n - 1)$
D. $a(n) = 4 + 3(n - 1)$
E. $a(n) = 3 + 4(n - 1)$
F. $a(n) = 4 + 3n$

2. The arithmetic sequence 6, 10, 14, 18, ... has first term $a(1) = 6$. Why do its terms fit a linear function of n?

A. Each time n goes up by 1, the term goes up by the same amount, 4.
B. Each term is the sum of the two terms before it.
C. Each term is 4 times the one before it.
D. The differences between terms grow by 4 each time.

3. An arithmetic sequence has first term $a(1) = 9$ and common difference -4. What is its 10th term, a(10)?

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4. Which recursive rule gives the arithmetic sequence 12, 17, 22, 27, ..., where 12 is term 1?

A. $a(1) = 12$, and $a(n) = 5a(n - 1)$ for $n \geq 2$
B. $a(1) = 5$, and $a(n) = a(n - 1) + 12$ for $n \geq 2$
C. $a(1) = 12$, and $a(n) = a(n - 1) + 5$ for $n \geq 2$
D. $a(1) = 17$, and $a(n) = a(n - 1) + 5$ for $n \geq 2$

5. Match each rule to the 10th term of its sequence. In every rule, $n = 1$ gives the first term.

Write the letter of the matching answer on each line.

1. _____ $a(n) = 2 + 5(n - 1)$
2. _____ $a(n) = 3n + 7$
3. _____ $a(n) = -8 + 2(n - 1)$
4. _____ $a(1) = 30$, and $a(n) = a(n - 1) - 3$ for $n \geq 2$

A. 3
B. 10
C. 37
D. 52
E. 0
F. 47

6. A theater has 20 rows. Row 1 has 18 seats, and each row after that has 2 more seats than the row before it. The number of seats in row n is $s(n) = 18 + 2(n - 1)$. Which statement about the inputs n of this sequence is true?

A. n can be any positive whole number, such as 25, because the pattern keeps going.

B. n can be any whole number from 0 to 20, because $s(0) = 16$.

C. n can be any number from 1 to 20, such as 2.5, because the rule works for any number.

D. n is a whole number from 1 to 20, because it counts the rows.

7. The terms of an arithmetic sequence start at $a(1) = 7$ and go up by 6 each time. Which term of the sequence is 97? Give its term number n.

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8. A sequence is defined by $a(1) = -5$ and $a(n) = a(n - 1) + 8$ for $n \geq 2$. Which explicit rule gives the same terms for every $n = 1, 2, 3$, and so on?

A. $a(n) = 8n + 3$

B. $a(n) = 8n - 13$

C. $a(n) = -5n + 8$

D. $a(n) = 8n - 5$