

Name: key

Date: _____

Write the explicit rule AND the recursive rule for each arithmetic sequence. Show your checked work for both:

1. 10, 15, 20, 25, ...

$$a_n = 5n + 5$$

$$a_n = a_{n-1} + 5; a_1 = 10$$

2. -9, -2, 5, 12, 19, ...

$$a_n = 7n - 16$$

$$a_n = a_{n-1} + 7; a_1 = -9$$

3. 23, 20, 17, 14, ...

$$a_n = -3n + 26$$

$$a_n = a_{n-1} - 3; a_1 = 23$$

4. 8, 6.5, 5, 3.5, 2, ...

$$a_n = -1.5n + 9.5$$

$$a_n = a_{n-1} - 1.5; a_1 = 8$$

Find the n th term for each arithmetic sequence:

5. $a_1 = -5, d = 4, n = 9$

$$\begin{aligned} a_9 &= -5 + 4(9-1) \\ &= -5 + 32 \\ &= 27 \end{aligned}$$

6. $a_1 = 13, d = -5/2, n = 29$

$$\begin{aligned} a_{29} &= 13 - \frac{5}{2}(29-1) \\ &= 13 - 70 \\ &= -57 \end{aligned}$$

Convert between explicit and recursive:

7. $a_n = -2n + 11$

$$a_1 = -2(1) + 11 = -2 + 11 = 9$$

$$a_n = a_{n-1} - 2; a_1 = 9$$

8. $a_n = a_{n-1} + 7; a_1 = -3$

$$a_n = -3 + (n-1)7$$

$$a_n = -3 + 7n - 7$$

$$a_n = 7n - 10$$

9. $a_n = a_{n-1} - 5; a_1 = 0$

$$a_n = 0 + (n-1)(-5)$$

$$a_n = 0 - 5n + 5$$

$$a_n = -5n + 5$$

10. $a_n = n - 16$

$$a_1 = 1 - 16 = -15$$

$$a_n = a_{n-1} + 1; a_1 = -15$$

Complete each statement:

11. 97 is the 26th term of: -3, 1, 5, 9

$$a_n = 4n - 7$$

$$97 = 4n - 7$$

$$104 = 4n$$

$$26 = n$$

12. -10 is the 17 th term of: 14, 12.5, 11, 9.5

$$-10 = 14 + (n-1)(-1.5)$$

$$-10 = 14 - 1.5n + 1.5$$

$$-22.5 = -1.5n$$

$$17 = n$$

Write the formula for the sequence that represents the following scenarios:

13. After making his first deposit, Paul has \$758 in his checking account. The next month, the balance is \$836. The balance after the third month is \$914.

$$d = \underline{78}$$

$$a_n = 758 + (n-1)78$$

$$a_1 = \underline{758}$$

$$a_n = 758 + 78n - 78$$

$$a_n =$$

Formula: $a_n = 78n + 680$

14. The table shows the number of people at a school who caught the flu each month after the flu shot was given:

Month	1	2	3	4	5
# of People	30	25	20	15	10

$$d = \underline{-5}$$

$$a_n = 30 + (n-1)(-5)$$

$$a_1 = \underline{30}$$

$$a_n = 30 - 5n + 5$$

Formula: $a_n = -5n + 35$

Find the indicated term(s) in each arithmetic sequence:

15. a_{15} for -3, 3, 9, ...

$$a_{15} = -3 + (15-1)6$$

$$= -3 + 84$$

$$= 81$$

16. Find the 38th term of 103, 99, 95, ...

$$a_{38} = 103 + (38-1)(-4)$$

$$= 103 - 148$$

$$= -45$$

17. Find the 43rd term of -124, -122, -120, ...

$$a_{43} = -124 + (43-1)(2)$$

$$= -124 + 84$$

$$= -40$$

18. The first term is 6 and the common difference is -4. Find the next 3 terms.

$6, 2, -2$