Arithmetic Sequences – Writing as a function

Algorithm

1. **Rewrite the sequence in a chart using x to represent n and y to represent the actual value of that term, a_n, of the sequence.**
2. **Use the Point-Slope Form of a line to write an equation;**

$$y - y_1 = m(x - x_1)$$

3. **Rewrite that using functional notation**

Example: **Write the following arithmetic sequence as a rule.**

4, 9, 14, 19, 24, …

Using (1, 4) and (2, 9) from the chart to find the slope, m

N	1	2	3	4	5
a_n	4	9	14	19	24

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - 4}{2 - 1} = 5$$

$$y - y_1 = m(x - x_1) \implies y - 4 = 5(x - 1)$$
$$y - 4 = 5x - 5$$
$$y = 5x - 1$$
$$f(x) = 5x - 1$$

Write an equation for the nth term of each arithmetic sequence.

1. **3, 7, 11, 15, …**

2. **5, 9, 13, 17, …**

3. **12, 7, 2, –3, …**

4. **9, 2, –5, …**

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5. $a_7 = 21, d = 5$

6. $a_8 = -8, d = -2$

7. $a_1 = 24, a_6 = -1$

8. $a_3 = 13, a_5 = 21$

9.   **Find the 1st term of #8, using the formula**

10.   **Find the first 5 terms of the arithmetic sequence described by $f(x) = 2x + 3$**