

## 8.2 Notes: Arithmetic Sequences and Partial Sums

**Arithmetic Sequences**, also known as a discrete linear function, is a sequence for which consecutive terms have a **common difference**,  $d$ .

Determine whether or not the sequence is arithmetic. If it is, find the common difference.

<p>1. 5, 8, 11, 14, 17, ...</p>	<p>2. 1, 4, 9, 16, 25, ...</p>
<p>3. <math>1, \frac{7}{6}, \frac{4}{3}, \frac{3}{2}, \frac{5}{3}, \dots</math></p>	<p>4. <math>1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots</math></p>

Writing an explicit formula/rule for an arithmetic sequence  $a_n$ .

Fill in the missing terms from the sequence:

$n$	1	2	3	4				
$a_n$	4	7	10	13				

**Expanded:**

$a_2 = 4 +$

$a_3 = 4 +$

$a_4 = 4 +$

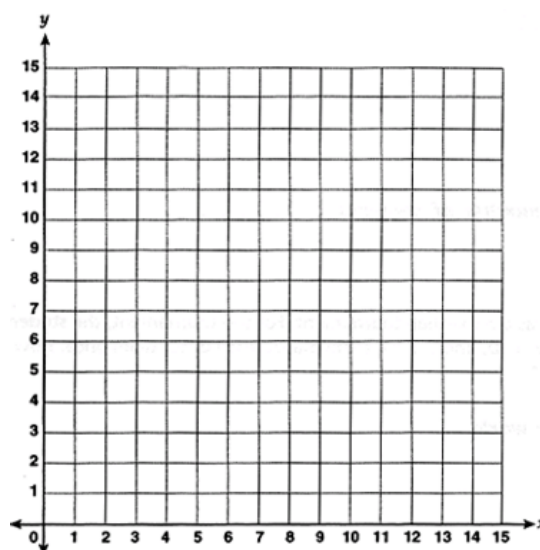
**Condensed:**

$a_2 = a_1 +$

$a_3 = a_1 +$

$a_4 = a_1 +$

**Arithmetic Explicit Rule:**  $a_n =$



Write an explicit rule for the given sequence. Then answer any additional questions. Assume  $n \geq 1$ .

<p>5. 5, 12, 19, 26, ...</p>	<p>6. Find an explicit formula for <math>a_n</math> for the arithmetic sequence with the following terms: <math>a_3 = 19</math> and <math>a_5 = 27</math>.</p>
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7. 29, 25, 21, 17, 13, 9,...	8. 11, 5, -1, -7, -13, -19,...
9. Find the first five terms of the arithmetic sequence where $a_8 = 25$ and $a_{12} = 41$ .	10. Find the 10 <sup>th</sup> term of the arithmetic sequence whose first two terms are 8 and 20.

### Arithmetic Series

Find the sum of:  $40+37+34+31+28+25+22$

The \_\_\_\_\_ of a finite arithmetic sequence with  $n$  terms ( $n^{\text{th}}$  partial sum) can be found by:

$$S_n = \frac{n}{2}(a_1 + a_n) \quad \text{where } n = \underline{\hspace{2cm}} \quad a_1 = \underline{\hspace{2cm}} \quad \text{and } a_n = \underline{\hspace{2cm}}$$

Find the sum of the finite arithmetic sequence.

11. Sum of integers from 1 to 35.	12. Sum of odd integers from 1 to 57
13. 50 <sup>th</sup> partial sum of the arithmetic sequence -6, -2, 2, 6,...	14. Determine the seating capacity of an auditorium with 30 rows of seats if there are 20 seats in the first row, 22 in the second, 24 in the third row, and so on.
15. $\sum_{n=1}^{100} (2 + 3n)$	16. $\sum_{n=21}^{100} (2 + 3n)$