ARITHMETIC SERIES

A **series** is the sum of the terms in a sequence.
An **arithmetic series** is the sum of the terms in an arithmetic sequence.

For example, for the arithmetic sequence 1, 4, 7, 10, … , **the arithmetic series** is 1 + 4 + 7 + 10 + … where t_4 represents the 4^{th} term, S_4 represents the sum of the first 4 terms.

The sum of the first n terms of an arithmetic sequence (a series) can be calculated in two ways:

❶ $S_n = \frac{n[2a+(n-1)d]}{2}$

❷ $S_n = \frac{n(t_1+t_n)}{2}$

Decide which one to use based on the information given.

Ex1. For the given arithmetic series, calculate t_{17} and S_{17}.
3 + 7 + 11 + …

Ex2. Find the sum of the first 12 terms of the arithmetic series with a = 3 and t_{12} = 36.

Ex3. Find the sum of the first 25 terms of the arithmetic series where the 14^{th} term is 102 and terms decrease by 9.

Ex4. Calculate the sum of the arithmetic series.
- 4 - 10 - 16 - … - 94

Ex5. In an amphitheatre, seats are arranged in 50 semicircular rows facing a domed stage. The first row contains 23 seats, and each row contains 4 more seats than the last. How many seats are there in total?

Ex6. Samantha deposited $128 into her bank account. Each week, she deposits $7 less than the previous week until she makes her last deposit of $9. Find the total value of her deposits.