

Notes 14-3 Series and Partial Sums

A **series** is formed by adding the terms of a sequence.

Ex. Sequence 3, 5, 7, 9, ...

Formula: $t_n =$

Series $3 + 5 + 7 + 9 + \dots + t_n$

When you sum up part of the series, it is called a **partial sum**, S_n

Ex. The third partial sum is $S_3 = 3 + 5 + 7$
 $S_3 = 15$

Find the 100th partial sum, S_{100} of $3 + 5 + 7 \dots$

$$S_{100} = \sum_{n=1}^{100} 1 + 2n$$

Each series is either arithmetic or geometric. Find the indicated partial sum.

1. $97 + 131 + 165 + \dots$, find S_{37}

2. $1000 + 900 + 810 + \dots$, find S_{22}

The n-th partial sum of an *arithmetic* series is $S_n = \frac{n}{2}(t_1 + t_n)$

The n-th partial sum of a *geometric* series is $S_n = t_1 \cdot \frac{1-r^n}{1-r}$ r is common ratio

The series is either arithmetic or geometric. Find n for the given partial sum.

3. $97 + 101 + 105 + \dots$, find n if $S_n = 21,663$

4. $13 + 26 + 52 + \dots$, find n if $S_n = 425,971$