

DO NOW

Consider the sequence 1, 2, 3, 4 ... The **sum** of the first six terms of this sequence is denoted by S_6 .

Find the **sum** for each of the following.

(Try to think of a shortcut rather than adding up each term one at a time...)

a)
$$S_6 = 1 + 2 + 3 + 4 + 5 + 6$$

b)
$$S_8 = 2 + 4 + 6 + 8 + 10 + 12 + 14 + 16$$

c)
$$S_{12} = 23 + 20 + 17 + 14 + 11 + 8 + 5 + 2 + -1 + -4 + -7 + -10$$

d)
$$S_{16} = t_1 + t_2 + t_3 + \dots + t_{15} + t_{16}$$

Things to think about:

What is the sum of each "pair?"

How many terms are there?

So how many **pairs** of terms?

Formula: Sum of the First n Terms of an Arithmetic Series:

$$S_n =$$

Objectives

- Find the sum of the first n terms of an arithmetic series
- Use the formula to evaluate an arithmetic series

Arithmetic Series: _____ the sum of the terms of an arithmetic
 _____ sequence (denoted by S_n)

$$S_n = \frac{n}{2}(t_1 + t_n)$$

So, What do you need to solve Arithmetic Series?

Arithmetic Series

Evaluate the related series of each sequence.

1) 13, 15, 17, 19, 21, 23

2) 6, 11, 16, 21, 26, 31, 36

3) 22, 28, 34, 40, 46

4) 39, 49, 59, 69

11) $a_1 = 42$, $a_n = 146$, $n = 14$

12) $a_1 = 4$, $a_n = 22$, $n = 10$

13) $a_1 = 2$, $a_n = 122$, $n = 13$

14) $a_1 = -18$, $a_n = -102$, $n = 13$

5) $\sum_{k=1}^{35} (5k - 2)$

6) $\sum_{i=1}^{35} (3i - 13)$

7) $\sum_{m=1}^{15} 4m$

8) $\sum_{m=1}^{10} (7m - 2)$

Homework: Have a relaxing evening!