Arithmetic Series: The sum of the terms in an Arithmetic Sequence.
(change all commas to addition)

Sum of first n terms of an Arithmetic Sequence:

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

n = # of terms t_1 = First term t_n = Last term

Find the sum of the first 15 terms of the sequence defined by this formula:

$t_n = -12 + 5(n-1)$

$n = 15$

Arithmetic Sequence where $t_1 = -12$

Last term = t_{15}

$t_{15} = -12 + 5(15-1) = 58$

$S_{15} = \frac{15}{2}(-12 + 58)$

$S_{15} = 345$

Find the sum of the terms in this sequence:

9, 16, 23, 30, ..., 93 (t_1, t_n)

Arithmetic $d = 7$

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

$= \frac{13}{2}(9 + 93)$

$= 6.5(102)$

$S_{13} = 663$

 # Terms

Write the explicit formula and replace t_n with the last term. This means that n will represent the number of terms:

$t_n = 9 + 7(n - 1)$

$93 = 9 + 7(n - 1)$

$-9 \quad -9$

$\frac{84}{7} = \frac{7(n-1)}{7}$

$12 = n - 1$

$+1 \quad +1$

$n = 13$ terms

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∑ - Uppercase Sigma - 18th letter of the Greek alphabet. represents "Sum of".

σ - lower case Sigma is used in statistics to represent Standard Deviation.

Do problem 12 on SAS2

12. Write the series represented by the sigma notation $\sum_{n=1}^{5}(2+3n)$.

first 5 terms

$\sum_{n=1}^{5}(2+3n)$.

explicit formula

n	$t_n = 2+3n$
1	$2+3(1) = 5$
2	$2+3(2) = 8$
3	$2+3(3) = 11$
4	$2+3(4) = 14$
5	$2+3(5) = 17$

5, 8, 11, 14, 17

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Play animation Panels 1& 2

Do problem 13 on SAS2

13. Represent the series 20 + 23 + 26 + 29 + 32 + 35 + 38 + 41 + 44 + 47 + 50 + 53 using sigma notation.

Arithmetic Series $d = 3$

Explicit Formula: $t_n = 20 + 3(n-1)$

terms = 12

$$\sum_{n=1}^{12} 20 + 3(n-1)$$

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