Apr. 5, 2017

Sect. 11-2

Arithmetic Sequences & Series

Defn.

Finding pattern

Finding n^{th} term

Finding sum

Using Sigma Notation

3, 5, 7, 9, 11, 13, 15, 17

+2 +2 +2 . . . . .

This is an arithmetic sequence because the same # is used to get the next term.

Common difference: $d = 2$

Find the 90TH term

$$a_n = a_1 + d(n-1)$$

$$a_{90} = 3 + 2(90-1)$$

$$= 3 + 178$$

$$a_{90} = 181$$

Find a_{21} for $5, 9, 13, \ldots$

$$a_{21} = 5 + 4(21 - 1)$$

$$= 5 + 80$$

$$a_{21} = 85$$

Arithmetic Mean (Average)

31, 37, 43

$3, 5, 7, 9, \ldots$

$3 + 5 + 7 + 9 + \ldots + a_n$ (Stop)

$$S_n = \frac{n(a_1 + a_n)}{2}$$

Find the sum of the first 31 terms of $3+5+7+\ldots$

$a_{31} = 3+2(31-1)$

$= 3+60 = 63$

$S_{31} = \frac{31(3+63)}{2} = \frac{31(66)}{2}$

$S_{31} = 1023$

Find S_{15} for 7, 10, 13, ...

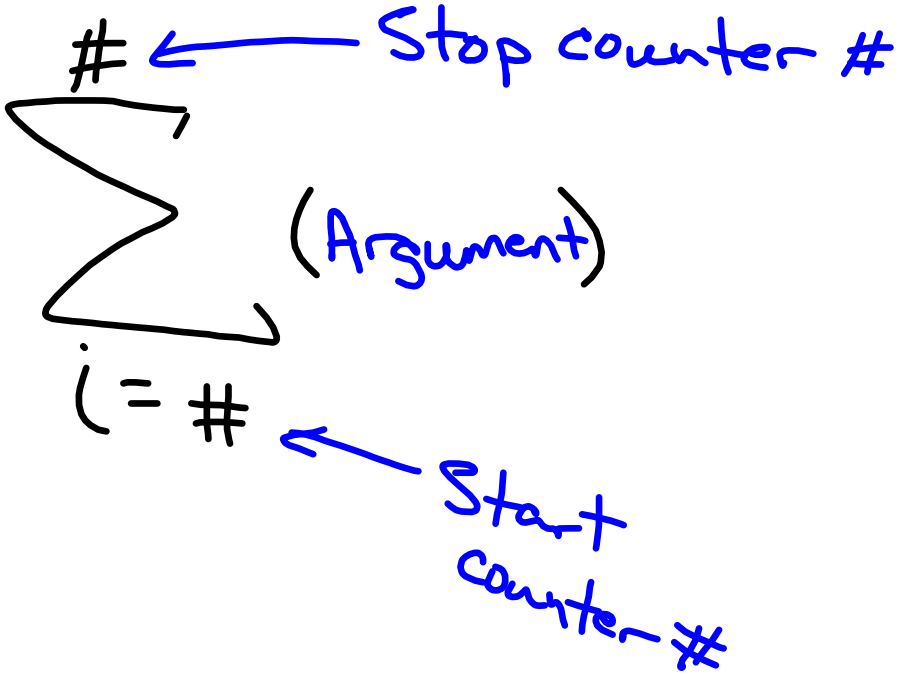
$$a_{15} = 7 + 3(15 - 1)$$

$$= 7 + 42 = 49$$

$$S_{15} = \frac{15(7 + 49)}{2} = \frac{15(56)}{2}$$

$$S_{15} = 420$$

Sigma Notation



$$\sum_{i=1}^{6} (2i)$$

Expand

$$2+4+6+8+10+12$$

$$=42$$

$$\sum_{i=3}^{7} (3i+1)$$

$$10 + 13 + 16 + 19 + 22$$

$$= 80$$

$$\sum_{i=1}^{105} (2i-1)$$

$a_1 = 2(1) - 1 = 1$

$a_n = 2(105) - 1 = 209$

$n = 105 - 1 + 1 = 105$

$$S_{105} = \frac{105(1+209)}{2}$$

$$S_{105} = 11,025$$