25

$$a_n = 5 + 10(n-1)$$

$$1000 = 5 + 10(n-1)$$

$$995 = 10(n-1)$$

$$99.5 = n-1$$

$$100.5 = n$$

after 100 terms.

34 $r=1.012$

$a_1 \to$ consumption in 2004 in millions

$a_n = 81(1.012)^{n-1}$

$100 = 81(1.012)^{n-1}$

$\frac{100}{81} = 1.012^{n-1}$

$\log\left(\frac{100}{81}\right) = (n-1)\log 1.012$

$18.67 = 1 + \frac{\log\left(\frac{100}{81}\right)}{\log 1.012} = n$

Series (Summing terms of a sequence).

Let

$a_n = 1, 2, 3, 4, 5, 6, 7, \ldots$

sum the first 4 terms.

$S_4 = 1+2+3+4 = 10$

$S_{100} = 1+2+3+ \cdots 97+98+99+100$

$S_{100} = 100+99+98+ \cdots 4+3+2+1$

$2S_{100} = 101(100)$

$S_{100} = \frac{101(100)}{2}$

better notation:

$\sum_{k=1}^{100} k = 1+2+3+\cdots+100$

Ex $a_n = 3, 6, 9, 12, 15$

$a_n = 3 + 3(n-1)$

$a_n = 3n$

notate summing the first 75 terms

$\sum_{x=1}^{75} (3x)$ or $\sum_{k=1}^{75} 3k$

Summing arithmetic sequences

if a_n is arithmetic.

$\sum_{n=1}^{N} a_n$ is an arithmetic series.

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

summing k terms

$S_k = a_1 + a_2 + \cdots + a_k$

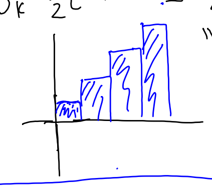
$= a_1 + (a_1+d) + (a_1+2d) + (a_1+3d) + \cdots + (a_1+(k-2)d) + a_1+(k-1)d$

reverse the order

$S_k = [a_1+(k-1)d] + \cdots + a_1$

$2S_k = [2a_1+(k-1)d]\,k$

$S_k = \frac{k}{2}[2a_1+(k-1)d] = \frac{k}{2}[a_1+a_k]$



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sum the first 75 even #'s

$x_n = 2n$

$\sum_{k=1}^{75} 2k = \frac{(2+150)}{2} \cdot 75 = 5700.$