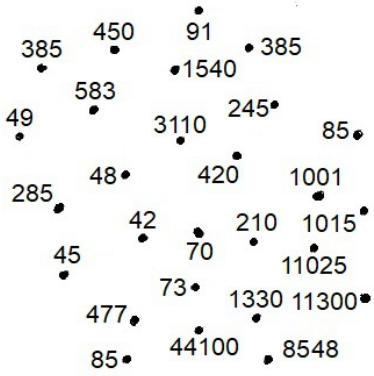
##.Last.First.Sum _____ © 2021, A^2, A. Azzolino

Simplify. Connect the answer dots in order



1. $\sum_{i=1}^{20} i$
2. $\sum_{i=1}^{14} 3$
3. $1^2+2^2+3^2+\ldots+9^2$
4. $\sum_{i=1}^{11} (i^2+i+1)$
5. $2^2+4^2+6^2+\ldots+20^2$
6. $\sum_{i=8}^{10} i^2$
7. $\sum_{i=4}^{14} i^2$
8. $\sum_{i=1}^{30} 7$
9. $1^2+3^2+5^2+7^2+\ldots+19^2$
10. $\sum_{i=1}^{20} i^3$
11. $\sum_{i=6}^{14} (5i+3)$
12. $\sum_{i=1}^{6} 7$

Used the symbol $\sum$

Leonhard Euler

$e^{i\varphi} = \cos\varphi + i\sin\varphi.$

V − E + F = 2.

Formalized or introduced the symbols: e, i, π

Did major work in: Mathematical notation, graph theory and topology, number theory, complex analysis

Properties of Summation

1. $\sum_{i=1}^{n} c = c \cdot n$, where c is a constant
2. $\sum_{i=m}^{n} (a_i \pm b_i) = \sum_{i=m}^{n} a_i \pm \sum_{i=m}^{n} b_i$
3. $\sum_{i=m}^{n} c \cdot a_i = c \cdot \sum_{i=m}^{n} a_i$
4. $\sum_{i=m}^{j} a_i + \sum_{i=j+1}^{n} a_i = \sum_{i=m}^{n} a_i$

APEX CALCULUS Version 4.0
Gregory Hartman, Ph.D.

$$\sum_{i=0}^{n} i = \sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$ (Sum of first natural numbers)

$$\sum_{i=0}^{n} i^2 = \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} = \frac{n^3}{3} + \frac{n^2}{2} + \frac{n}{6}$$

$$\sum_{i=0}^{n} i^3 = \left(\sum_{i=0}^{n} i\right)^2 = \left(\frac{n(n+1)}{2}\right)^2 = \frac{n^4}{4} + \frac{n^3}{2} + \frac{n^2}{4}$$
(Nicomachus's theorem)

$$\sum_{i=1}^{n} (2i-1) = n^2$$ (Sum of first odd natural numbers)

$$\sum_{i=0}^{n} 2i = n(n+1)$$ (Sum of first even natural numbers)

Summation - Wikipedia en.wikipedia.org/wiki/Summation#Capital-sigma_notation