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General Series Formulas

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List of 21 General Series Formulas

General Series 🔗

Fibonacci Sequence 🔗

1) Nth Term of Fibonaccci Sequence 🔗

fx $F_n = F_{n-1} + F_{n-2}$

Open Calculator 🔗

ex $21 = 13 + 8$

2) Nth Term of Fibonaccci Sequence using Golden Ratio 🔗

fx $F_n = \dfrac{[phi]^{n_{Fib}} - (1 - [phi])^{n_{Fib}}}{\sqrt{5}}$

Open Calculator 🔗

ex $21 = \dfrac{[phi]^8 - (1 - [phi])^8}{\sqrt{5}}$

3) Sum of First N Even Index Fibonacci Numbers 🔗

fx $S_{n(Fib)Even} = F_{2n+1} - 1$

Open Calculator 🔗

ex $1596 = 1597 - 1$

4) Sum of First N Fibonacci Numbers 🔗

fx $S_{n(Fib)} = F_{n+2} - 1$

Open Calculator 🔗

ex $54 = 55 - 1$

5) Sum of First N Odd Index Fibonacci Numbers 🔗

fx $S_{n(Fib)Odd} = 1 \cdot F_{2n}$

Open Calculator 🔗

ex $987 = 1 \cdot 987$

Sum of 4th Powers ⚹

6) Sum of 10th Powers of First N Natural Numbers ⚹

fx   Open Calculator ⚹

$$S_{n10} = \frac{n \cdot (n+1) \cdot (2 \cdot n + 1) \cdot (n^2 + n - 1) \cdot (3 \cdot n^6 + 9 \cdot n^5 + 2 \cdot n^4 - 11 \cdot n^3 + 3 \cdot n^2 + 10}{66}$$

ex

$$60074 = \frac{3 \cdot (3+1) \cdot (2 \cdot 3 + 1) \cdot \left((3)^2 + 3 - 1\right) \cdot \left(3 \cdot (3)^6 + 9 \cdot (3)^5 + 2 \cdot (3)^4 - 11 \cdot (3)^3 + 3 \cdot (3)^2 + 10 \cdot 3 -}{66}$$

7) Sum of 4th Powers of First N Natural Numbers ⚹

fx   Open Calculator ⚹

$$S_{n4} = \frac{n \cdot (n+1) \cdot (2 \cdot n + 1) \cdot \left(3 \cdot n^2 + 3 \cdot n - 1\right)}{30}$$

ex $$98 = \frac{3 \cdot (3+1) \cdot (2 \cdot 3 + 1) \cdot \left(3 \cdot (3)^2 + 3 \cdot 3 - 1\right)}{30}$$

8) Sum of 5th Powers of First N Natural Numbers ⚹

fx   Open Calculator ⚹

$$S_{n5} = \frac{n^2 \cdot \left(2 \cdot n^2 + 2 \cdot n - 1\right) \cdot (n+1)^2}{12}$$

ex $$276 = \frac{(3)^2 \cdot \left(2 \cdot (3)^2 + 2 \cdot 3 - 1\right) \cdot (3+1)^2}{12}$$

9) Sum of 6th Powers of First N Natural Numbers ⚹

fx   Open Calculator ⚹

$$S_{n6} = \frac{n \cdot (n+1) \cdot (2 \cdot n + 1) \cdot \left(3 \cdot n^4 + 6 \cdot n^3 - 3 \cdot n + 1\right)}{42}$$

ex $$794 = \frac{3 \cdot (3+1) \cdot (2 \cdot 3 + 1) \cdot \left(3 \cdot (3)^4 + 6 \cdot (3)^3 - 3 \cdot 3 + 1\right)}{42}$$

10) Sum of 7th Powers of First N Natural Numbers ⚹

fx   Open Calculator ⚹

$$S_{n7} = \frac{n^2 \cdot \left(3 \cdot n^4 + 6 \cdot n^3 - n^2 - 4 \cdot n + 2\right) \cdot (n+1)^2}{24}$$

ex $$2316 = \frac{(3)^2 \cdot \left(3 \cdot (3)^4 + 6 \cdot (3)^3 - (3)^2 - 4 \cdot 3 + 2\right) \cdot (3+1)^2}{24}$$

11) Sum of 8th Powers of First N Natural Numbers ⟲

fx　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Open Calculator ⟲

$$S_{n8} = \frac{n \cdot (n+1) \cdot (2 \cdot n + 1) \cdot \left(5 \cdot n^6 + 15 \cdot n^5 + 5 \cdot n^4 - 15 \cdot n^3 - n^2 + 9 \cdot n - 3\right)}{90}$$

ex $6818 = \dfrac{3 \cdot (3+1) \cdot (2 \cdot 3 + 1) \cdot \left(5 \cdot (3)^6 + 15 \cdot (3)^5 + 5 \cdot (3)^4 - 15 \cdot (3)^3 - (3)^2 + 9 \cdot 3 - 3\right)}{90}$

12) Sum of 9th Powers of First N Natural Numbers ⟲

fx $S_{n9} = \dfrac{n^2 \cdot \left(n^2 + n - 1\right) \cdot \left(2 \cdot n^4 + 4 \cdot n^3 - n^2 - 3 \cdot n + 3\right) \cdot (n+1)^2}{20}$　　Open Calculator ⟲

ex $20196 = \dfrac{(3)^2 \cdot \left((3)^2 + 3 - 1\right) \cdot \left(2 \cdot (3)^4 + 4 \cdot (3)^3 - (3)^2 - 3 \cdot 3 + 3\right) \cdot (3+1)^2}{20}$

Sum of Cubes ⟲

13) Sum of Cubes of First N Even Numbers ⟲

fx $S_{n3(Even)} = 2 \cdot (n \cdot (n+1))^2$　　　　　　　　　　　　　Open Calculator ⟲

ex $288 = 2 \cdot (3 \cdot (3+1))^2$

14) Sum of Cubes of First N Natural Numbers ⟲

fx $S_{n3} = \dfrac{(n \cdot (n+1))^2}{4}$　　　　　　　　　　　　　　　Open Calculator ⟲

ex $36 = \dfrac{(3 \cdot (3+1))^2}{4}$

15) Sum of Cubes of First N Odd Numbers ⟲

fx $S_{n3(Odd)} = (n)^2 \cdot \left(2 \cdot (n)^2 - 1\right)$　　　　　　　　　　Open Calculator ⟲

ex $153 = (3)^2 \cdot \left(2 \cdot (3)^2 - 1\right)$

Sum of Squares ⧉

16) Sum of Squares of First N Even Natural Numbers ⧉

fx $$S_{n2(Even)} = \frac{2 \cdot n \cdot (n+1) \cdot ((2 \cdot n) + 1)}{3}$$

ex $$56 = \frac{2 \cdot 3 \cdot (3+1) \cdot ((2 \cdot 3) + 1)}{3}$$

Open Calculator ⧉

17) Sum of Squares of First N Natural Numbers ⧉

fx $$S_{n2} = \frac{n \cdot (n+1) \cdot ((2 \cdot n) + 1)}{6}$$

ex $$14 = \frac{3 \cdot (3+1) \cdot ((2 \cdot 3) + 1)}{6}$$

Open Calculator ⧉

18) Sum of Squares of First N Odd Natural Numbers ⧉

fx $$S_{n2(Odd)} = \frac{n \cdot ((2 \cdot n) + 1) \cdot ((2 \cdot n) - 1)}{3}$$

ex $$35 = \frac{3 \cdot ((2 \cdot 3) + 1) \cdot ((2 \cdot 3) - 1)}{3}$$

Open Calculator ⧉

Sum of Terms ⧉

19) Sum of First N Even Natural Numbers ⧉

fx $$S_{n(Even)} = n \cdot (n+1)$$

ex $$12 = 3 \cdot (3+1)$$

Open Calculator ⧉

20) Sum of First N Natural Numbers ⧉

fx $$S_n = \frac{n \cdot (n+1)}{2}$$

ex $$6 = \frac{3 \cdot (3+1)}{2}$$

Open Calculator ⧉

21) Sum of First N Odd Natural Numbers ⧉

fx $$S_{n(Odd)} = n^2$$

ex $$9 = (3)^2$$

Open Calculator ⧉

Variables Used

- F_{2n} 2Nth Term of Fibonacci Sequence
- F_{2n+1} (2N+1)th Term of Fibonacci Sequence
- F_n Nth Term of Fibonacci Sequence
- F_{n+2} (N+2)th Term of Fibonacci Sequence
- F_{n-1} (N-1)th Term of Fibonacci Sequence
- F_{n-2} (N-2)th Term of Fibonacci Sequence
- n Value of N
- n_{Fib} Value of N of Fibonacci Sequence
- S_n Sum of First N Natural Numbers
- $S_{n(Even)}$ Sum of First N Even Natural Numbers
- $S_{n(Fib)}$ Sum of First N Fibonacci Numbers
- $S_{n(Fib)Even}$ Sum of First N Even Index Fibonacci Numbers
- $S_{n(Fib)Odd}$ Sum of First N Odd Index Fibonacci Numbers
- $S_{n(Odd)}$ Sum of First N Odd Natural Numbers
- S_{n10} Sum of 10th Powers of First N Natural Numbers
- S_{n2} Sum of Squares of First N Natural Numbers
- $S_{n2(Even)}$ Sum of Squares of First N Even Natural Numbers
- $S_{n2(Odd)}$ Sum of Squares of First N Odd Natural Numbers
- S_{n3} Sum of Cubes of First N Natural Numbers
- $S_{n3(Even)}$ Sum of Cubes of First N Even Natural Numbers
- $S_{n3(Odd)}$ Sum of Cubes of First N Odd Natural Numbers
- S_{n4} Sum of 4th Powers of First N Natural Numbers
- S_{n5} Sum of 5th Powers of First N Natural Numbers
- S_{n6} Sum of 6th Powers of First N Natural Numbers
- S_{n7} Sum of 7th Powers of First N Natural Numbers
- S_{n8} Sum of 8th Powers of First N Natural Numbers
- S_{n9} Sum of 9th Powers of First N Natural Numbers

Constants, Functions, Measurements used

- Constant: **[phi]**, 1.6180339887498948482045868343656381l
  Golden ratio
- Function: **sqrt**, sqrt(Number)
  Square root function

Check other formula lists

- **General Series Formulas** ⬈
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