

求首项、末项和项数和列出各级数

1.  $\sum_{n=1}^5 n^2$
2.  $\sum_{n=1}^6 n(n+1)$
3.  $\sum_{n=2}^5 \frac{n}{n+1}$
4.  $\sum_{n=1}^5 (-1)^n (2n+1)$
5.  $\sum_{n=3}^7 (2n+3)$
6.  $\sum_{n=5}^{10} \frac{n^2}{2}$
7.  $\sum_{n=1}^{10} n^2 + 1$
8.  $\sum_{n=4}^8 3^2 - 2^n$
9.  $\sum_{n=1}^5 n(n+3)$
10.  $\sum_{n=1}^6 \frac{1}{n(2n+1)}$
11.  $\sum_{n=2}^6 \frac{1}{3^n}$
12.  $\sum_{n=2}^5 \frac{1}{n^2+2}$
13.  $\sum_{n=1}^8 \frac{n+2}{n}$
14.  $\sum_{n=4}^{10} 3n^2 - n$
15.  $\sum_{n=9}^{14} n^2(n-7)$

以 $\Sigma$  表示各级数

1.  $1.3 + 3 + 3 + 3 + 3$
2.  $2.3 + 3^2 + 3^3 + \dots + 3^{20}$
3.  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}$
4.  $4.3 \times 4 + 4 \times 6 + 5 \times 8 + 6 \times 10$
5.  $2 \times 5 + 3 \times 7 + 4 \times 9 + \dots + 15 \times 31$
6.  $6.1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{30}$
7.  $7.1^3 + 2^3 + 3^3 + \dots + 50^3$
8.  $8.1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \frac{1}{16}$
9.  $9.2 \times 4 + 4 \times 7 + 6 \times 10 + 8 \times 13 + 10 \times 16$
10.  $10.2 \times 5 + 3 \times 7 + 4 \times 9 + \dots + 15 \times 31$

自然数求和公式

$$\sum_{k=1}^n k = \frac{n(n+1)}{2}$$

自然数平方求和公式

$$\sum_{k=1}^n k^2 = \frac{1}{6}n(n+1)(2n+1)$$

自然数立方求和公式

$$\sum_{k=1}^n k^3 = \left[\frac{n(n+1)}{2}\right]^2 = \frac{1}{4}n^2(n+1)^2$$

练习

1.  $1^2 + 2^2 + 3^2 + \dots + 10^2$
2.  $11^3 + 12^3 + \dots + 20^3$
3.  $\sum_{k=1}^{10} (3k - 2)$
4.  $\sum_{k=5}^{12} (2k - 1)^2$
5.  $1 \times 2 + 2 \times 3 + 3 \times 4 + \dots + n(n+1)$
6.  $1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \dots$
7.  $\sum_{k=1}^8 3k$
8.  $\sum_{k=1}^{12} k^2$
9.  $\sum_{k=3}^{10} (2k - 3)$
10.  $\sum_{k=7}^{13} 3k^2$
11.  $\sum_{k=3}^6 2k^3$
12.  $\sum_{k=6}^{10} (2k^2 + 3)$