具体数学阅读笔记-chap2Ex

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1 Exercises

1.1 Warmups

练习 1 1

题目解答 1 1. $\sum_{k=m}^{n} q_k$ is always equivolent to $\sum_{m\leqslant k\leqslant n} q_k$ then the stated sum is zero.
2. $q_4+q_3+q_2+q_1+q_0$.
3. We can say that $\sum_{m\leqslant k\leqslant n} q_k = \sum_{k\leqslant n} q_k - \sum_{k<m} q_k$. then $\sum_{k=4}^{0} q_k = -q_1-q_2-q_3$.
[obey the law $\sum_{k=a}^{b}+\sum_{k=b}^{c}=\sum_{k=a}^{c}, \quad \forall a,b,c$] .
It's best to use the notation $\sum_{k=m}^{n}$ only when $n-m\geqslant 1$; then both conventions 1 and 3 agree.

练习 2 2

题目解答 2 the quantity ([x>0]_[x<0]) is often called sign(x) or signum(x).

$$sign(x)=\begin{cases} 1, & x>0; \\ 0, & x=0; \\ -1, & x<0; \end{cases}$$

$x\ sign(x) = |x|$, [] 判定命题真假

练习 3 3

题目解答 3

$$\sum_{0\leqslant k\leqslant 5} a_k = a_0 + a_1 + a_2 + a_3 + a_4 + a_5$$

$$\begin{aligned} \textstyle\sum_{0\leqslant k^2\leqslant 5} a_k \quad &= a_4 \quad +a_1 \quad +a_0 \quad +a_1 \quad +a_4 \\ (k \quad &= -2, \quad -1, \quad 0, \quad 1, \quad 2) \end{aligned}$$

练习 4 $\sum_{1\leqslant i<j<k\leqslant k} a_{ijk}$

题目解答 4

$$I = \sum_{1\leqslant i\leqslant 4} \sum_{1\leqslant j\leqslant 4} \sum_{1\leqslant k\leqslant 4} a_{ijk} \quad (k \to j \to i) \tag{1}$$

$$I = \sum_{1\leqslant k\leqslant 4} \sum_{1\leqslant j\leqslant 4} \sum_{1\leqslant i\leqslant 4} a_{ijk} \quad (i \to j \to k) \tag{2}$$

1.

$$\begin{cases} \quad a_{1jk} \\ + \quad a_{2jk} \\ + \quad a_{3jk} \\ + \quad a_{4jk} \end{cases}$$

$$\begin{cases} a_{12k} & +a_{13k} & +a_{14k} \\ & +a_{23k} & +a_{24k} \\ & & +a_{34k} \end{cases}$$

$$\begin{cases} a_{123} & +a_{124} & +a_{134} \\ & +a_{234} & \end{cases}$$

(1). $\Big(\big(a_{123} + a_{124}\big) + a_{134}\Big) + a_{234}$.

$k \to j \to i$

(2). $a_{123}+\left(a_{124}+\left(a_{134}+a_{234}\right)\right)$.

$i \to j \to k$

练习 5 $\left(\sum_{j=1}^{n} a_j\right)\left(\sum_{k=1}^{n} \frac{1}{a_k}\right)=\sum_{j=1}^{n}\sum_{k=1}^{n} \frac{a_j}{a_k}=\sum_{k=1}^{n}\sum_{k=1}^{n} \frac{a_k}{a_k}=n.$

where is wrong?