

11. Let $f: \mathbf{R} \rightarrow \mathbf{R}$ be defined by $f(x) = x^2$. For each of the following subsets B of \mathbf{R} , find $f^{-1}(B)$.

(令 $f: \mathbf{R} \rightarrow \mathbf{R}$ 定义为 $f(x) = x^2$. 对于 \mathbf{R} 的以下每个子集 B 求出 $f^{-1}(B)$)

a) $B = \{0, 1\}$

b) $B = \{-1, 0, 1\}$

c) $B = [0, 1]$

d) $B = [0, 1)$

e) $B = [0, 4]$

f) $B = (0, 1] \cup (15, 17)$

12. Let $\mathcal{U} = \{1, 2, 3, 4, 5\}$, with $A = \mathcal{P}(\mathcal{U})$, and let \mathcal{R} be the subset relation on A . For each of the following subsets B (of A), determine the lub and glb of B .

(令 $\mathcal{U} = \{1, 2, 3, 4, 5\}$. $A = \mathcal{P}(\mathcal{U})$, 并且令 \mathcal{R} 是 A 上的子集关系。对于以下各个 (A 的) 子集 B 分别确定 B 的 lub 和 glb)

a) $B = \{\{1\}, \{2\}, \{3\}\}$

b) $B = \{\{1\}, \{2\}, \{3\}, \{1, 2, 4\}\}$

c) $B = \{\emptyset, \{1\}, \{2\}, \{1, 2\}\}$

d) $B = \{\{1\}, \{1, 2\}, \{1, 3\}, \{1, 2, 3\}\}$

e) $B = \{\{1\}, \{2\}, \{3\}, \{5\}, \{1, 2\}, \{1, 3\}, \{2, 3\}\}$

13. If $A = \{1, 2, 3, 4, 5, 6, 7\}$ and \mathcal{R} is the equivalence relation on A that induces the partition $A = \{1, 2\} \cup \{3, 4\} \cup \{5, 6, 7\}$, what is \mathcal{R} ?

(如果 $A = \{1, 2, 3, 4, 5, 6, 7\}$. \mathcal{R} 是 A 上的等价关系并且诱导出划分 $A = \{1, 2\} \cup \{3, 4\} \cup \{5, 6, 7\}$. 那么 \mathcal{R} 是什么?)

14. There are eight children sitting on a merry-go-round. How many ways can you change seats so that each child is not sitting in front of the original child?

(8 个小孩围坐在旋转木马上, 问有多少种变换座位的方法, 使得每个小孩前面坐的都不是原来的小孩?)

15. It is arranged to review five projects A, B, C, D and E from Monday to Friday. Each project is arranged one day and one project is arranged one day. However, it is required that project A will not be reviewed on Tuesday, project B will not be reviewed on Wednesday and Friday, project C will not be reviewed on Thursday, project D will not be reviewed on Monday, and project E will not be reviewed on Wednesday and Thursday. How many different evaluation schemes are there?

(现安排从星期一到星期五对 5 个项目 A, B, C, D, E, 进行评审, 每个项目安排一天, 每天安排一个项目。但要求项目 A 不安排在星期二评审, 项目 B 不安排在星期三和星期五评审, 项目 C 不安排在星期四评审, 项目 D 不安排在星期一评审, 项目 E 不安排在星期三和星期四评审。问有多少种不同的评审方案?)