

3(1) a) 双射的,  $f^{-1}: \mathbb{R} \rightarrow \mathbb{R}$ ,  $f^{-1}(x) = x$

b)  $f(\{8\}) = \{8\}$ ,  $f^{-1}(\{4\}) = \{4\}$

(2) a) 双射的,  $f^{-1}: \mathbb{R}^+ \rightarrow \mathbb{R}$ ,  $f^{-1}(x) = \log_2 x$

b)  $f(\{1\}) = \{2\}$ ,  $f^{-1}(\{1, 2\}) = \{0, 1\}$

(3) a) 单射的

b)  $f(\{5\}) = \{(5, 6)\}$ ,  $f^{-1}(\{(2, 3)\}) = \{2\}$

(4) a) 单射的

b)  $f(\{2, 3\}) = \{5, 7\}$ ,  $f^{-1}(\{1, 3\}) = \{0, 1\}$

(5) a) 满射的

b)  $f(\{-1, 2\}) = \{1, 2\}$ ,  $f^{-1}(\{1\}) = \{-1, 1\}$

(6) a) 单射的

b)  $f((0, 1)) = (\frac{1}{4}, \frac{3}{4})$ ,  $f^{-1}([\frac{1}{4}, \frac{1}{2}]) = [0, \frac{1}{2}]$

(7) a) 单射的

b)  $f(\{0, \frac{1}{2}\}) = \{1, \frac{2}{3}\}$ ,  $f^{-1}(\{\frac{1}{2}\}) = \{1\}$

(8) a) 单射的

b)  $f((0, 1)) = (1, +\infty)$ ,  $f^{-1}(\{2, 3\}) = \{\frac{1}{2}, \frac{1}{3}\}$

24 (1)  $= f = \{(1, a), (2, b), (3, c)\}$

(2)  $= f(x) = 2x$

(3)  $= f(x) = -x - 1$

(4)  $= f(x) = a^x$

35  $A = \{2^n \mid n \in \mathbb{N}\}$ ,  $B = \{2^k \mid k \in \mathbb{N}\}$ ,  $C = \mathbb{Z}^+$

