

T₁ (1) 不是 (2) 不是 (3) 是

T₂ (1) 是函数 $\text{dom}(f) = \{1, 2, 3\}$ $\text{ran}(f) = \{\langle 2, 3 \rangle, \langle 3, 2 \rangle, \langle 4, 1 \rangle\}$

(2) 不是

(3) 是函数: $\text{dom}(f) = \{1, 2, 3\}$, $\text{ran}(f) = \{\langle 2, 3 \rangle\}$

T₃ (1) $f \cap g$ 不是 如 $A = \{1, 2, 3\}$ $B = \{1, 2, 3\}$

$f = \{\langle 1, 1 \rangle, \langle 2, 3 \rangle, \langle 3, 2 \rangle\}$ $g = \{\langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 3, 3 \rangle\}$

$f \cap g = \{\langle 1, 1 \rangle\}$ 不是函数.

(2) $f \cup g$ 不是, 如上题 $f \cup g = \{\langle 1, 1 \rangle, \langle 2, 2 \rangle, \langle 2, 3 \rangle, \langle 3, 2 \rangle, \langle 3, 3 \rangle\}$
不是函数.

T₄ $f(0) = 0$; $f[\{0\}] = \{0\}$; $f[\{0, 2, 4, \dots\}] = \{0, 1, 2, \dots\}$

$f[\{1, 3, 5, \dots\}] = \{1\}$; $f^{-1}[\{2\}] = \{4\}$; $f^{-1}[\{3, 4\}] = \{6, 8\}$

T₆ (1) 不是满射 不是单射 不是双射.

(2). 不是满射 是单射 不是双射.

(3). 不是满射 不是单射 不是双射.

(4). 不是满射 不是单射 不是双射

T₇: 当等价类个数与元素个数相同 \Leftrightarrow 恒等关系

T₉

$$(1) \quad n \geq m \quad (2) \quad m \geq n \quad (3) \quad n = m$$

T₁₀

$$(2) \quad f: A \rightarrow B, \quad t = 2x+1$$

(3)

$$B = \{t_1, t_2, t_3, t_4, t_5, t_6, t_7, t_8\}$$

$$f_1 = \{\langle a, 0 \rangle, \langle b, 0 \rangle, \langle c, 0 \rangle\}$$

$$f_2 = \{\langle a, 1 \rangle, \langle b, 0 \rangle, \langle c, 0 \rangle\}$$

$$f_3 = \{\langle a, 0 \rangle, \langle b, 1 \rangle, \langle c, 0 \rangle\}$$

$$f_4 = \{\langle a, 0 \rangle, \langle b, 0 \rangle, \langle c, 1 \rangle\}$$

$$f_5 = \{\langle a, 1 \rangle, \langle b, 1 \rangle, \langle c, 0 \rangle\}$$

$$f_6 = \{\langle a, 1 \rangle, \langle b, 0 \rangle, \langle c, 1 \rangle\}$$

$$f_7 = \{\langle a, 0 \rangle, \langle b, 1 \rangle, \langle c, 1 \rangle\}$$

$$f_8 = \{\langle a, 1 \rangle, \langle b, 1 \rangle, \langle c, 1 \rangle\}$$

$$\therefore f = \{\langle \emptyset, t_1 \rangle, \langle \{a\}, t_2 \rangle, \langle \{b\}, t_3 \rangle, \langle \{c\}, t_4 \rangle, \\ \langle \{a, b\}, t_5 \rangle, \langle \{b, c\}, t_6 \rangle, \langle \{a, c\}, t_7 \rangle, \langle \{a, b, c\}, t_8 \rangle\}$$