2-1.

1. a). $x=\pm 1$ b). $x=1.2.3.4.5.6.7.8,9.10.11.$

c). $x=1.4.9.16.25.36.49.64.81.$

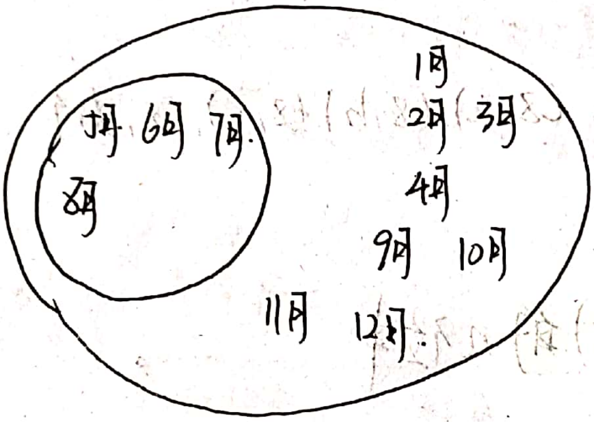
d). ϕ.

3. a). 相等.   b). 不相等.   c) 不相等.

5. a). F.   b). F.   c). F.   d) F.

e). F.   f) T.   g). F

7.



10 a). 1.   b). 1   c). 2.   d). 3.

16. a). $\{\phi, \{a\}\}$.   b). $\{\phi, \{a\}, \{b\}, \{a,b\}\}$

c). $\{\phi, \{\phi\}, \{\{\phi\}\}, \{\phi, \{\phi\}\}\}$.

18. a). 8个　　b). 16个　　c). 2个

13. ① 当 $A \subseteq B$. 有 $P(A) \subseteq P(B)$

若 $x \subseteq A$. 则 $x \subseteq B$. 则 $P(A) \subseteq P(B)$

② 若 $P(A) \subseteq P(B)$ 设 $a \in A$. 则 $\{a\} \in P(A)$.

又 $P(A) \subseteq P(B)$. 则 $\{a\} \in P(B)$ ...

则 $a \in B$. 则可得 $A \subseteq B$

15).

a). $A \times B = \{(a,y),(a,z),(b,y),(b,z),(c,y),(c,z),(d,y),(d,z)\}$

b). $B \times A = \{(y,a),(y,b),(y,c),(y,d),(z,a),(z,b),(z,c),(z,d)\}$

24). 列出所有长为2^n（n为集合元素个数）的n位串.
再写出对应子集.

2-2.

2.

a). $A \cup B = \{0,1,2,3,4,5,6\}$

b). $A \cap B = \{3\}$

c). $A - B = \{1,2,4,5\}$

d) $B - A = \{0,6\}$

6. a). $A \cup B = B \cup A$.

证: $A \cup B \subseteq B \cup A$.

$x \in A \cup B$. by assumption.

$(x \in A) \vee (x \in B)$. defn of Union.

$(x \in B) \vee (x \in A)$. 交换律

$x \in B \cup A$ defn of Union

则 $A \cup B \subseteq B \cup A$.

~~同理~~ 证: $B \cup A \subseteq A \cup B$

$x \in B \cup A$ by assumption.

$(x \in B) \vee (x \in A)$ defn of union

$(x \in A) \vee (x \in B)$ 交换律

$x \in A \cup B$ defn of Union

则 $B \cup A \subseteq A \cup B$

综上. $A \cup B = B \cup A$.

b) $A \cap B = B \cap A$.

A	B	$A \cap B$	$B \cap A$
1	1	1	1
1	0	0	0
0	1	0	0
0	0	0	0

由成员表可知成立.

9). a).

证: $\overline{A\cap B\cap C} \subseteq \bar{A}\cup\bar{B}\cup\bar{C}$

$x \in \overline{A\cap B\cap C}$ by assumption

$x \notin A\cap B\cap C$ defn of complement

$\neg(x\in A \wedge x\in B \wedge x\in C)$ defn of intersection.

$\neg(x\in A)\vee\neg(x\in B)\vee\neg(x\in C)$ 1st. De Morgan Law for Prop Logic.

$x\notin A \vee x\notin B \vee x\notin C.$ defn of negation

$x\in\bar{A} \vee x\in\bar{B} \vee x\in\bar{C}$ defn of complement.

$x\in\bar{A}\cup\bar{B}\cup\bar{C}$ defn of union

证: $\bar{A}\cup\bar{B}\cup\bar{C} \subseteq \overline{A\cap B\cap C}$

$x\in\bar{A}\cup\bar{B}\cup\bar{C}$ by assumption.

$x\in\bar{A}\vee x\in\bar{B}\vee x\in\bar{C}$ defn of union.

$x\notin A\vee x\notin B\vee x\notin C$ defn of complement

$\neg(x\in A)\vee\neg(x\in B)\vee\neg(x\in C)$. defn of negation.

$\neg(x\in A\wedge x\in B\wedge x\in C)$. 1st De Morgan Law for Prop Logic.

$\neg(x\in A\cap B\cap C)$. defn of intersection.

$x\in\overline{A\cap B\cap C}$. defn of complement.

b.

A	B	C.	$A\cap B\cap C$.	$\overline{A\cap B\cap C}$	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}\cup\bar{B}\cup\bar{C}$
1	1	1	1	0	0	0	0	0
1	1	0	0	1	0	0	1	1
1	0	1	0	1	0	1	0	1
1	0	0	0	1	0	1	1	1
0	1	1	0	1	1	0	0	1
0	1	0	0	1	1	0	1	1
0	0	1	0	1	1	1	0	1
0	0	0	0	1	1	1	1	1

16).

$$A \subseteq B \equiv \forall x\,(x \in A \to x \in B) \equiv \forall x\,(x \notin B \to x \notin A)$$

$$\equiv \forall x\,(x \in \overline{B} \to x \in \overline{A}) \equiv \overline{B} \subseteq \overline{A}$$

18).

$$A \oplus B \equiv [(x \in A) \wedge (x \notin B)] \cup [(x \in B) \wedge (x \notin A)]$$

$$\equiv (x \in (A \cap \overline{B})] \cup [x \in (B \cap \overline{A})]$$

$$\equiv (A - (A \cup B)) \cup (B - (A \cap B))$$

$$\equiv (A \cup B) - (A \cap B)$$

28). 若第一个位串的第i位是1，第二个位串第i位是0.
则两个集合之差位串的第i位是1、否则是0.