1 (3) 设0表示次品, 1表示正品.

$$S = \{00, 100, 0100, 0101, 0110, 1100, 1010, 1011, 0111, 1101, 1110, 1111\}$$

(4) 设x,y分别表示二维平面上的横纵坐标.

$$S = \left\{ (x, y) \mid x^2 + y^2 < 1 \right\}$$

3. (a)
$$P(A \cup B) = P(A) + P(B) - P(AB)$$

(b)
$$P(\overline{A} \cdot \overline{B}) = P(\overline{A \cup B}) = 1 - P(A \cup B)$$

(c)
$$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(AB) - P(AC) - P(BC) + P(ABC)$$

(d)
$$P(\overline{A} \cdot \overline{B} \cdot \overline{C}) = P(\overline{A \cup B \cup C}) = 1 - P(A \cup B \cup C)$$

(e)
$$P(\overline{A} \cdot \overline{B}C) + P(\overline{A} \cdot \overline{B} \cdot \overline{C}) = P(\overline{A} \cdot \overline{B})$$
$$\Rightarrow P(\overline{A} \cdot \overline{B}C) = P(\overline{A} \cdot \overline{B}) - P(\overline{A} \cdot \overline{B} \cdot \overline{C})$$

(f)
$$P(\overline{A} \cdot \overline{B} \cup C) = P(\overline{A} \cdot \overline{B}) + P(C) - P(\overline{A} \cdot \overline{B}C)$$

8. 设A ="恰有90件次品", B ="至少有两件次品"

(a)
$$P(A) = \frac{C_{400}^{90} C_{1100}^{110}}{C_{1500}^{200}}$$

(b)
$$P(B) = 1 - \frac{C_{1100}^{200} + C_{400}^1 C_{1100}^{199}}{C_{1500}^{200}}$$

16. 设A ="孩子得病", B ="母亲得病", C ="父亲得病", 问题是求$P(AB\overline{C})$

$$P(AB\overline{C}) = P(A)P(B|A)P(\overline{C}|AB)$$
$$= P(A)P(B|A)[1 - P(C|AB)]$$
$$= 0.6 \times 0.5 \times 0.6$$
$$= 0.18$$