

# Tema 4

$$① (A-B) \cup (A \cap B) = (A \cap \bar{B}) \cup (A \cap B) = A \cup (\bar{B} \cap B) = A \cup \emptyset = A$$

$$A \Delta B = (A \cup B) - (A \cap B) = (B \cup A) - (B \cap A) = B \Delta A$$

$$② \begin{array}{r} 606 \overline{) 108} \\ 66 \overline{) 5} \end{array} \quad \begin{array}{r} 108 \overline{) 66} \\ 42 \overline{) 1} \end{array} \quad \begin{array}{r} 66 \overline{) 42} \\ 24 \overline{) 1} \end{array} \quad \begin{array}{r} 42 \overline{) 24} \\ 18 \overline{) 1} \end{array} \quad \begin{array}{r} 24 \overline{) 18} \\ 6 \overline{) 1} \end{array} \quad \begin{array}{r} 18 \overline{) 6} \\ 0 \overline{) 3} \end{array} \rightarrow \text{mcd}$$

$$\begin{array}{l} 606 = 108 \cdot 5 + 66 \quad ① \\ 108 = 1 \cdot 66 + 42 \quad ② \\ 66 = 42 \cdot 1 + 24 \quad ③ \\ 42 = 24 \cdot 1 + 18 \quad ④ \\ 24 = 18 \cdot 1 + 6 \quad ⑤ \end{array}$$

$$\Rightarrow 6 = 24 + (-1)18 = 24 + (-1)[42 + (-1)24] = (-1)42 + (2)24 = (-1)42 + 2[66 + (-1)42]$$

$$= 2 \cdot 66 + (-3)42 = 2 \cdot 66 + (-3)[108 + (-1)66] = 5 \cdot 66 + (-3)108$$

$$① \quad 5[606 + (-5)108] + (-3)108 = \boxed{5 \cdot 606 + (-28)108}$$

$$③ \sum_{i=1}^{n+1} i(i+1) = 1 \cdot 2 = 2 \quad \text{HI} \quad \sum_{i=1}^h i(i+1) = \frac{h(h+1)(h+2)}{3}$$

$$\frac{1 \cdot 2 \cdot 3}{3} = 2$$

$$\text{TI} \quad m = h+1 \quad \sum_{i=1}^{h+1} i(i+1) = \frac{(h+1)(h+2)(h+3)}{3}$$

$$D) \sum_{i=1}^{h+1} i(i+1) = \sum_{i=1}^h i(i+1) + (h+1)(h+2) \stackrel{\text{HI}}{=} \frac{h(h+1)(h+2)}{3} + (h+1)(h+2)$$

$$= (h+1)(h+2) \left[ \frac{h+3}{3} \right] = \frac{(h+1)(h+2)(h+3)}{3}$$

$$④ P(A) = \{\emptyset, \{a\}, \{b\}, A\}$$

$$R = \left\{ (\emptyset, \emptyset); (\emptyset, \{a\}); (\emptyset, \{b\}); (\emptyset, A); (\{a\}, \{a\}); (\{a\}, A); (\{b\}, \{b\}); (\{b\}, A); (A, A) \right\}$$

$$\Pi_R = \begin{pmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{pmatrix} \quad R^{-1} = \{(y, x) \mid (x, y) \in R\} = \left\{ (\emptyset, \emptyset); (\{a\}, \emptyset); (\{b\}, \emptyset); (A, \emptyset); (\{a\}, \{a\}); (A, \{a\}); (\{b\}, \{b\}); (A, \{b\}); (A, A) \right\}$$

$$\bar{R} = \{(x, y) \mid (x, y) \notin R\} = \left\{ (\emptyset, \{a\}); (\{a\}, \{b\}); (\{b\}, \emptyset); (\{b\}, \{a\}); (A, \emptyset); (A, \{a\}); (A, \{b\}) \right\}$$

R es reflexiva (diagonal de 1)

no simétrica ( $\exists (\emptyset, \{a\}) \in R \wedge (\{a\}, \emptyset) \notin R$ )

$\exists (\emptyset, \{a\}) \in R \wedge (\{a\}, \emptyset) \in R$

antisimétrica  $\Pi_R \wedge (\Pi_R)^t \leq I$

transitiva ↓