(15) а) $\varnothing \subseteq \varnothing$ истина, И

б) $\varnothing \subset \varnothing$ ложь, Л

в) $\varnothing \in \varnothing$ ложь

г) $\varnothing \subseteq A$, где A - произвольное множество, истина

д) $\varnothing \in A$, где A - произвол множ, ложь

(16)

а) $\{2\} \in \{1, 2, 3, 4, 5\}$ ложь

$2 \in \{1, 2, 3, 4, 5\}$ И

$\{2\} \in \{1, \{2\}, 3, 4, 5\}$ И

б) $\{2\} \subseteq \{1, 2, 3, 4, 5\}$ И

в) $\varnothing = \{\varnothing\}$ Л

г) $\{1, 2, 3\} \in \{1, 2, 3, \{1, 2, 3\}\}$ И

д) $\{1, 2, 3\} \subseteq \{1, 2, 3, \{1, 2, 3\}\}$ И

(17)

а) $\{\varnothing, \{\varnothing\}\}$ 2 элемента

б) $\{\{\varnothing, \{\varnothing\}\}\}$ 1 элемент

в) $\{1, 2, 3, \{1, 2, 3\}\}$ 4 элемента

г) $\{\varnothing, \{\varnothing\}, a, B, \{a, B\}, \{a, B, \{a, B\}\}\}$ 6 эл.

д) $\{\varnothing, \{\varnothing\}, \{\varnothing, \{\varnothing\}\}\}$ 3 эл

Операции над множествами

① $A=\{1,2,3,4,5,6,7\}$ $B=\{4,5,6,7,8,9,10\}$

$C=\{2,4,6,8,10\}$ $U=\{1,2,3,4,5,6,7,8,9,10\}$

а) $A \cup C=\{1,2,3,4,5,6,7,8,10\}$

б) $A \cap B=\{4,5,6,7\}$

в) $A \cap (B \cup C)=A \cap \{2,4,5,6,7,8,9,10\}=\{2,4,5,6,7\}$

г) $(A \cap B) \cup C\}=\{4,5,6,7\} \cup C=\{2,4,5,6,8,10\}$

д) $(A \cap B)' = U-(A \cap B)=U-\{4,5,6,7\}=$

$=\{1,2,3,8,9,10\}$

е) $A' \cap B'=(U-A) \cap (U-B)=\{8,9,10\} \cap \{1,2,3\}=\varnothing$

ж) $A \triangle B=(A-B) \cup (B-A)=\{1,2,3\} \cup \{8,9,10\}=$

$=\{1,2,3,8,9,10\}$

з) $A-B=\{1,2,3,4,5,6,7\}-\{4,5,6,7,8,9,10\}=\{1,2,3\}$

② $A=\{1,2,3,4,5,6,7\}$ $B=\{4,5,6,7,8,9,10\}$

$C=\{2,4,6,8,10\}$ $U=\{1,2,3,4,5,6,7,8,9,10\}$

а) $A-C=\{1,2,3,4,5,6,7\}-\{2,4,6,8,10\}=\{1,3,5,7\}$

б) $(A-B) \cup (B-A)=\{1,2,3\} \cup \{8,9,10\}=\{1,2,3,8,9,10\}$

в) $A \cap (B \cap C')=A \cap (B \cap \{1,3,5,7,9\})=$ $C'=U-C$ $=$

$=A \cap \{5,7,9\}=\{5,7\}$

$B \cap C'=B-C$

$\{5,7,9\}=\{5,7,9\}$ } !

2) $(A \cup C) - B' = \{1,2,3,4,5,6,7,8,10\} - \{1,2,3\} =$

$= \{4,5,6,7,8,10\}$

g) $(A - \varnothing) \cup (A - A) = A - \varnothing = A$

e) $B \triangle C = (B - C) \cup (C - B) = \{5,7,9\} \cup \{2\} = \{2,5,7,9\}$

ж) $C - A = \{2,4,6,8,10\} - \{1,2,3,4,5,6,7\} = \{8,10\}$

③ $A = \{1,2,3\}$ $B = \{a, B\}$

а) $A \times B = \{(1,a), (1,B), (2,a), (2,B), (3,a), (3,B)\}$

б) $B \times B = \{(a,a), (a,B), (B,a), (B,B)\}$

в) $A \times \varnothing = \varnothing$

④ $A = \{1,2,3\}$ $B = \{a, B\}$

а) $A \times A = \{(1,1), (1,2), (1,3), (2,1), (2,2), (2,3), (3,1), (3,2), (3,3)\}$

б) $B \times A = \{(a,1), (a,2), (a,3), (B,1), (B,2), (B,3)\}$

~~в)~~ $A \times B = \{(1,a), (1,B), (2,a), (2,B), (3,a), (3,B)\}$ – меньше

в) $A \triangle B = (A - B) \cup (B - A) = \{1,2,3\} \cup \{a, B\} = \{1,2,3,a,B\}$

⑤ $A = \varnothing$ $P(A)$ – ?

$P(A) = \{\varnothing\}$

⑥ $A = \{\varnothing, \{\varnothing\}\}$ $P(A)$ – ?

$P(A) = \{\varnothing, \{\varnothing\}, \{\{\varnothing\}\}, \{\varnothing, \{\varnothing\}\}\}$

⑦ $A = \varnothing$ $P(P(A))$ – ?

1) $P(A) = \{\varnothing\}$

2) $P(\{\varnothing\}) = \{\varnothing, \{\varnothing\}\}$