Практика 1 ДМ

1. $A = (-\infty; 3] \quad B = (2; 5] \quad A \vee B \quad A \setminus B$
2. $A = [0; 4) \quad B = [3; +\infty) \quad A \wedge B \quad B \setminus A$

1. $A \vee B = (-\backslash; 5]$
   $A \wedge B = (2; 3]$
   $A \setminus B = (-\infty; 2]$
   $B \setminus A = (3; 5]$
2. $A \vee B = [0; +\infty)$
   $A \wedge B = [3; 4)$
   $A \setminus B = [0; 3)$
   $B \setminus A = [4; +\infty)$

$A = \{3n : n \in Z \wedge n \geq 4\}$
$B = \{2n : n \in Z\}$
$C = \{n : n \in Z \wedge n^2 \leq 100\}$

1. Множество всех нечетных чисел $Z \setminus B$
2. $\{-10, -8, -6, \ldots, 8, 10\} \Leftrightarrow C \wedge B$
3. $\{6n : n \in Z \wedge n \geq 2\} \Leftrightarrow A \wedge B$
4. $\{-9, -7, -5, \ldots, 5, 7, 9\} \Leftrightarrow C \setminus B$

1. $\overline{(\overline{A}) \wedge \overline{(B \vee C)}} = A \vee B \vee C$
2. $(A \setminus B) \setminus C = A \setminus (B \vee C)$
   $A \wedge \overline{B} \wedge \overline{C} = A \wedge \overline{(B \vee C)}$
3. $(A \vee B \vee C) \wedge (A \vee \overline{B} \vee C) \wedge \overline{(A \vee C)} = 0$

$A * B = \overline{(A \wedge B)}$

1. $A * A = \overline{A}$
2. $(A * A) * (B * B) = A \vee B$
3. $(A * B) * (A * B) = A \wedge B$

$A = \{1, 3, 5\} \quad B = \{2, 4\} \quad C = \{1, 2\}$

1. $A \times B = \{(1, 2), (1, 4), (3, 2), (3, 4), (5, 2), (5, 4)\}$
2. $B \times C = \{(2, 1), (2, 2), (4, 1), (4, 2)\}$
3. $A \times B \times C = \{(1, 2, 1), (1, 2, 2), (1, 4, 1), (1, 4, 2), (3, 2, 1), (3, 2, 2), (3, 4, 1),$
   $(3, 4, 2), (5, 2, 1), (5, 2, 2), (5, 4, 1), (5, 4, 2)\}$
4. $B \times C \times A = \{(2, 1, 1), (2, 1, 3), (2, 1, 5), (2, 2, 1), (2, 2, 3), (2, 2, 5), (4, 1, 1),$
   $(4, 1, 3), (4, 1, 5), (4, 2, 1), (4, 2, 3), (4, 2, 5)$

$A, B, C, D \neq 0 \quad x \in A \quad (x, y) \in A \times C$

Доказать

$A \subseteq B \wedge C \subseteq D \equiv A \times C \subseteq B \times D$

Доказательство

1. Пусть
2. $x \in A, A \subseteq B \implies x \in B$
   $y \in C, C \subseteq D \implies y \in D$
3. $\{(x, y)\} = A \times C$
   $\forall (x, y) \in A \times C \rightarrow \forall (x, y) \in B \times D \implies A \times C \subseteq B \times D$