DM HOMEWORK 2 (29 января 2016 г.)

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Problem 1.
Let $M = (8, 15),\ N = (9, 20)$ on real axis, then $K = M \cup N$ will be $(8, 20)$

Problem 2.
$A = \{a, b, \{a, b\}\}$. How many elements does this set have: $P(A)$.

$$N(A) = 3$$
$$N(P(A)) = 2^{N(A)} = 2^3 = 8$$

Problem 3.

- For every x in $\mathbb{R}$ x in power of two not equal to minus one. It's true.
- Exists such x in $\mathbb{Z}$, that x in power of two equal to 2. It's false.

Problem 4.
Let $A = \{1, 2, 3, 4, 5\}$ and $B = \{0, 3, 6\}$. Find

- $A \cup B = \{0, 1, 2, 3, 4, 5, 6\}$
- $A \cap B = \{3\}$
- $A - B = \{1, 2, 4, 5\}$
- $B - A = \{0, 6\}$

Problem 5.
$A - B = A \cap B^c$

$$x \in (A - B) \Rightarrow x \in A \& x \notin B \Rightarrow x \in A \& x \in B^c \Rightarrow x \in (A \cap B^c)$$

$$x \in (A \cap B^c) \Rightarrow x \in A \& x \in B^c \Rightarrow x \in A \& x \notin B \Rightarrow x \in (A - B)$$

Problem 6.

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

Problem 7.
It's hard enough to draw them with LaTeX.

- $A \cap (B - C)$ will look like three circles and only one small part, that belongs to A and B, but not C will be filled.
- All universe will be filled, except circles related to A, B, C.

Problem 8.
$A^c \cup (A \cup B^c \cup C^c)^c \cup (B \cap (A \cup C)^c) = A^c \cup (B - (A \cup C)) = A^c$

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