Dimat 1. gyak

1.) $U = \{0,1,\dots,9\}$; $A = \{x \mid x \in \mathbb{N} \wedge 1 \leq x \leq 4\} = \{1,2,3,4\}$

$B = \{0,2,4,8\}$; $C = \{$ az egyjegyű primek $\} = \{2,3,5,7\}$

a)

$A \cap B = \{2,4\}$ $\quad B \cup C = \{0,2,3,4,5,7,8\}$

$A \setminus C = \{1,4\}$ $\quad \overline{C} = \{0,1,4,6,8,9\}$

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b.) $X = \{A,B,C\}$

$\cap X = \{x \mid x \in A \wedge x \in B \wedge x \in C\} = \{2\}$

$\cup X = \{x \mid x \in A \vee x \in B \vee x \in C\} = \{0,1,2,3,4,5,7,8\}$

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c.) $Y = \{ \{ x \mid x \in U \wedge x$ páros $\}$; $\{ x \mid x \in U \wedge x$ páratlan $\} \} =$

$= \{ \{0,2,4,6,8\} ; \{1,3,5,7,9\} \}$

$4 \in B \rightarrow$ igaz ✓ $\quad A \subseteq B \rightarrow$ nem igaz ✗

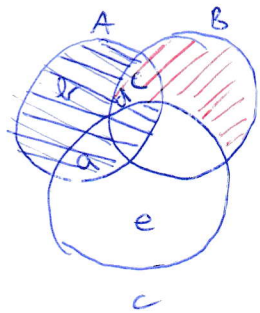
$\{1,2\} \subseteq A \rightarrow$ igaz ✓ $\quad A \in X \cup Y \rightarrow$ igaz ✓

$2 \subseteq A \rightarrow$ nem igaz ✗ $\quad \{2\} \subseteq A \rightarrow$ igaz ✓

(Additional task)

3.) $A = \{a,b,c,d\}$; $B = \{c,d\}$; $C = \{a,e\}$

$A \setminus (B \setminus C) = \{a,b\} \stackrel{?}{=} (A \setminus B) \cup (B \cap C) = \{a,b\}$



note: $(B \cap C) \setminus A$ - val több a jobb oldal

3.) $X = \{\{1,2,3\}, \{2,3,4,5\}, \{0,2,3,7\}\}$

a.) $\cap X = \{2,3\}$

b.) $X \cup \{\{3,5,7\}, \{1\}, \{2\}\} = \{\{1\}, \{2\}, \{3,5,7\}, \{1,2,3\}, \{2,3,4,5\}, \{0,2,3,7\}\}$

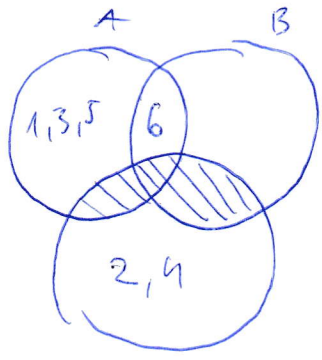
c.) $\cup(X \cup \{\{3,5,7\}, \{1\}, \{2\}\}) = \{0,1,2,3,4,5,7\}$

d.) $\cap$ — " — $= \emptyset$

~~5.) HF~~

4.) $A \setminus B = \{1,3,5\}$; $A \cup B \cup C = \{1,2,3,4,5,6\}$

$(A \cap C) \cup (B \cap C) = \emptyset$; $C \setminus B = \{2,4\}$; $(A \cap B) \setminus C = \{6\}$



$A = \{1,3,5,6\}$

$B = \{6\}$

$C = \{2,4\}$

5.)

a.) $x \in (A \cup B) \Leftrightarrow x \in A \vee x \in B \Leftrightarrow x \in B \vee x \in A \Leftrightarrow x \in (B \cup A)$

b.) $x \in (A \cup B) \cup C \Leftrightarrow x \in (A \cup B) \vee x \in C \Leftrightarrow (x \in A \vee x \in B) \vee x \in C \Leftrightarrow$

$\Leftrightarrow x \in A \vee (x \in B \vee x \in C) \Leftrightarrow x \in A \vee x \in (B \cup C) \Leftrightarrow x \in A \cup (B \cup C)$

c.) HF

d.) HF

e.) $x \in A \cup (B \cap C) \Leftrightarrow x \in A \vee x \in (B \cap C) \Leftrightarrow x \in A \vee (x \in B \wedge x \in C) \Leftrightarrow$

$\Leftrightarrow (x \in A \vee x \in B) \wedge (x \in A \vee x \in C) \Leftrightarrow x \in (A \cup B) \wedge x \in (A \cup C) \Leftrightarrow x \in (A \cup B) \cap (A \cup C)$

f.) HF

g.) $x \in (\overline{A \cup B}) \Leftrightarrow x \notin (A \cup B) \Leftrightarrow \neg(x \in (A \cup B)) \Leftrightarrow \neg(x \in A \vee x \in B) \Leftrightarrow$ ~~$x \notin A \wedge x \notin B$~~

$\Leftrightarrow \neg(x \in A) \wedge \neg(x \in B) \Leftrightarrow x \notin A \wedge x \notin B \Leftrightarrow x \in \bar{A} \wedge x \in \bar{B} \Leftrightarrow x \in \bar{A} \cap \bar{B}$

k.) HF

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11) (evtl: $A \setminus B = A \cap \bar{B}$)

a.) $x \in (A \cap B) \setminus C \Leftrightarrow x \in (A \cap B) \wedge x \notin C \Leftrightarrow (x \in A \wedge x \in B) \wedge x \in \bar{C} \Leftrightarrow$

$\Leftrightarrow (x \in A \wedge x \in \bar{C}) \wedge (x \in B \wedge x \in \bar{C}) \Leftrightarrow x \in (A \setminus C) \wedge x \in (B \setminus C) \Leftrightarrow$

$\Leftrightarrow x \in (A \setminus C) \cap (B \setminus C)$

b.) $x \in A \setminus (B \cup C) \Leftrightarrow x \in A \wedge x \notin (B \cup C) \Leftrightarrow x \in A \wedge (x \notin B \vee x \notin C) \Leftrightarrow$

$\Leftrightarrow (x \in A \wedge x \notin B) \wedge (x \in A \wedge x \notin C)$