



Ime in Priimek: _____

Naloga 1:

10

Dane so univerzalna množica U ter množici A in B . Zapiši z naštevanjem elementov množice

$$A \cup B, \quad A \cap B, \quad A \setminus B, \quad B \setminus A, \quad A^c, \quad B^c$$

in določi moči $|A \cup B|$ ter $|A \cap B|$. Preveri, da velja $|A \cup B| = |A| + |B| - |A \cap B|$.

- a) $U = \{1, 2, \dots, 10\}$, $A = \{1, 2, 3, 4, 5\}$, $B = \{4, 5, 6, 7\}$
- b) $U = \{1, 2, \dots, 12\}$, $A = \{x \in U; x \text{ je sodo število}\}$, $B = \{x \in U; x \text{ je večkratnik števila } 3\}$
- c) $U = \{A, E, I, K, L, M, O, T\}$, A je množica črk besede MATEMATIKA, B je množica črk besede TEKMA
- d) $U = \{0, 1, 2, \dots, 9\}$, $A = \{x \in U; x < 5\}$, $B = \{x \in U; x \text{ je praštevilo}\}$
- e) $U = \{1, 2, \dots, 15\}$, $A = \{x \in U; x \text{ deli } 12\}$, $B = \{x \in U; x \text{ deli } 15\}$

Dane so univerzalna množica U ter množice A, B in C . Elemente vpiši v Vennov diagram in zapiši množice

$$A \cap B \cap C, \quad A \cup B \cup C, \quad (A \cup B) \cap C, \quad (A \cap C) \setminus B, \quad A \setminus (B \cup C), \quad (A \cup B \cup C)^c$$

ter določi moč $|A \cup B \cup C|$.

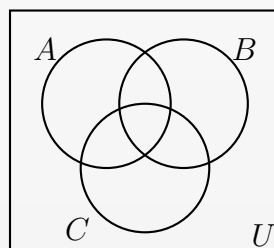
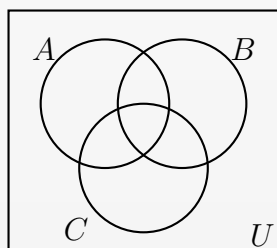
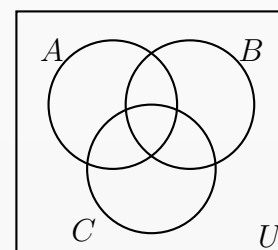
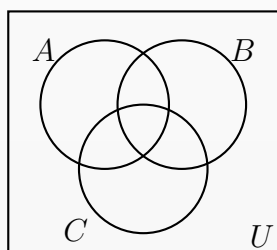
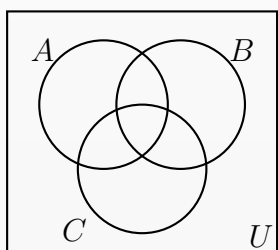
a) $U = \{1, 2, \dots, 10\}, \quad A = \{1, 2, 3, 4, 5\}, \quad B = \{2, 4, 6, 8\}, \quad C = \{1, 2, 6, 7, 9\}$

b) $U = \{1, 2, \dots, 12\}, \quad A = \{x \in U; x \text{ je sodo}\}, \quad B = \{x \in U; 3 \text{ deli } x\}, \quad C = \{x \in U; x < 6\}$

c) $U = \{1, 2, \dots, 20\}, \quad A = \text{delitelji števila 12}, \quad B = \text{delitelji števila 18}, \quad C = \text{delitelji števila 20}$

d) $U = \{0, 1, 2, \dots, 9\}, \quad A = \{x \in U; x \text{ je praštevilo}\}, \quad B = \{x \in U; x \text{ je liho}\}, \quad C = \{x \in U; x \geq 5\}$

e) $U = \{a, b, c, d, e, f, g, h, i, j\}, \quad A = \{a, b, c, d, e\}, \quad B = \{d, e, f, g\}, \quad C = \{a, e, g, h, i\}$



Moč unije dveh množic: $|A \cup B| = |A| + |B| - |A \cap B|$. Pri vsaki nalogi si pomagaj z Vennovim diagramom.

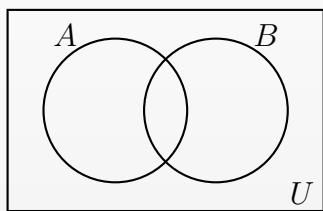
- V razredu je 28 dijakov. Nogomet jih trenira 17, košarko 13, oboje pa 7. Koliko dijakov trenira vsaj en šport? Koliko dijakov ne trenira nobenega od teh dveh športov?
- V razredu je 30 dijakov, vsak se uči vsaj enega tujega jezika. Angleščine se jih uči 18, nemščine 15. Koliko dijakov se uči obeh jezikov? Koliko se jih uči samo nemščine?
- Velja $|A| = 12$, $|B| = 9$ in $|A \cup B| = 17$. Izračunaj $|A \cap B|$, $|A \setminus B|$ in $|B \setminus A|$.
- V anketi je sodelovalo 50 ljudi. Kavo jih pije 32, čaj 24, 10 pa jih ne pije ne kave ne čaja. Koliko jih pije oboje? Koliko jih pije samo kavo in koliko samo čaj?
- Velja $|U| = 40$, $|A| = 22$, $|A \cap B| = 6$ in $|(A \cup B)^c| = 8$. Izračunaj $|A \cup B|$, $|B|$ in $|B \setminus A|$.

Moč unije treh množic: $|A \cup B \cup C| = |A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C|$.

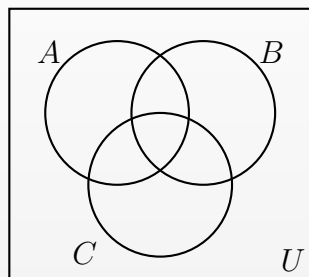
- Velja $|A| = 10$, $|B| = 12$, $|C| = 8$, $|A \cap B| = 4$, $|A \cap C| = 3$, $|B \cap C| = 5$ in $|A \cap B \cap C| = 2$. Izračunaj $|A \cup B \cup C|$.
- V razredu je 30 dijakov. Matematični krožek obiskuje 14 dijakov, fizikalnega 12, kemijskega 10. Matematiko in fiziko obiskuje 5 dijakov, matematiko in kemijo 4, fiziko in kemijo 3, vse tri krožke pa 2 dijaka. Koliko dijakov ne obiskuje nobenega krožka? Koliko jih obiskuje samo matematični krožek?
- V anketi med 100 ljudmi jih 52 uporablja Netflix, 40 Spotify in 30 YouTube Premium. Netflix in Spotify jih uporablja 18, Netflix in YouTube 12, Spotify in YouTube 10, vse tri storitve pa 5. Koliko ljudi ne uporablja nobene od storitev? Koliko jih uporablja natanko eno storitev?
- Koliko števil od 1 do 100 je deljivih z 2, s 3 ali s 5? Koliko jih ni deljivo z nobenim od teh števil?
- Velja $|A \cup B \cup C| = 40$, $|A| = 20$, $|B| = 18$, $|C| = 15$, $|A \cap B| = 7$, $|A \cap C| = 6$ in $|B \cap C| = 5$. Izračunaj $|A \cap B \cap C|$ in število elementov, ki so samo v množici A .

V Vennovem diagramu osenči dano množico.

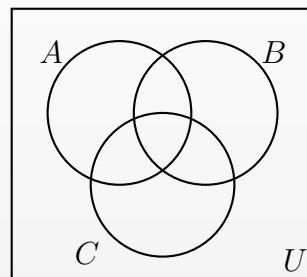
a) $A^c \cap B$



b) $(A \cap B) \cup C$



c) $(A \cup B) \setminus C$

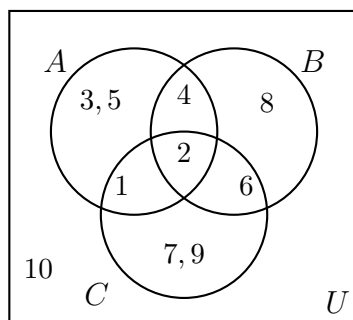


Analiza Naloge 1: – Operacije z dvema množicama

- a) $A \cup B = \{1, 2, 3, 4, 5, 6, 7\}$, $A \cap B = \{4, 5\}$, $A \setminus B = \{1, 2, 3\}$, $B \setminus A = \{6, 7\}$,
 $A^c = \{6, 7, 8, 9, 10\}$, $B^c = \{1, 2, 3, 8, 9, 10\}$; $|A \cup B| = 7$, $|A \cap B| = 2$ ($5 + 4 - 2 = 7$)
- b) $A = \{2, 4, 6, 8, 10, 12\}$, $B = \{3, 6, 9, 12\}$
 $A \cup B = \{2, 3, 4, 6, 8, 9, 10, 12\}$, $A \cap B = \{6, 12\}$, $A \setminus B = \{2, 4, 8, 10\}$, $B \setminus A = \{3, 9\}$,
 $A^c = \{1, 3, 5, 7, 9, 11\}$, $B^c = \{1, 2, 4, 5, 7, 8, 10, 11\}$; $|A \cup B| = 8$, $|A \cap B| = 2$ ($6 + 4 - 2 = 8$)
- c) $A = \{M, A, T, E, I, K\}$, $B = \{T, E, K, M, A\}$ (velja $B \subseteq A$)
 $A \cup B = A = \{A, E, I, K, M, T\}$, $A \cap B = B = \{A, E, K, M, T\}$, $A \setminus B = \{I\}$, $B \setminus A = \emptyset$,
 $A^c = \{L, O\}$, $B^c = \{I, L, O\}$; $|A \cup B| = 6$, $|A \cap B| = 5$ ($6 + 5 - 5 = 6$)
- d) $A = \{0, 1, 2, 3, 4\}$, $B = \{2, 3, 5, 7\}$
 $A \cup B = \{0, 1, 2, 3, 4, 5, 7\}$, $A \cap B = \{2, 3\}$, $A \setminus B = \{0, 1, 4\}$, $B \setminus A = \{5, 7\}$,
 $A^c = \{5, 6, 7, 8, 9\}$, $B^c = \{0, 1, 4, 6, 8, 9\}$; $|A \cup B| = 7$, $|A \cap B| = 2$ ($5 + 4 - 2 = 7$)
- e) $A = \{1, 2, 3, 4, 6, 12\}$, $B = \{1, 3, 5, 15\}$
 $A \cup B = \{1, 2, 3, 4, 5, 6, 12, 15\}$, $A \cap B = \{1, 3\}$, $A \setminus B = \{2, 4, 6, 12\}$, $B \setminus A = \{5, 15\}$,
 $A^c = \{5, 7, 8, 9, 10, 11, 13, 14, 15\}$, $B^c = \{2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$; $|A \cup B| = 8$, $|A \cap B| = 2$
 $(6 + 4 - 2 = 8)$

Analiza Naloge 2: – Operacije s tremi množicami

- a) $A \cap B \cap C = \{2\}$, $A \cup B \cup C = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $(A \cup B) \cap C = \{1, 2, 6\}$,
 $(A \cap C) \setminus B = \{1\}$, $A \setminus (B \cup C) = \{3, 5\}$, $(A \cup B \cup C)^c = \{10\}$; $|A \cup B \cup C| = 9$
- b) $A = \{2, 4, 6, 8, 10, 12\}$, $B = \{3, 6, 9, 12\}$, $C = \{1, 2, 3, 4, 5\}$
 $A \cap B \cap C = \emptyset$, $A \cup B \cup C = \{1, 2, 3, 4, 5, 6, 8, 9, 10, 12\}$, $(A \cup B) \cap C = \{2, 3, 4\}$,
 $(A \cap C) \setminus B = \{2, 4\}$, $A \setminus (B \cup C) = \{8, 10\}$, $(A \cup B \cup C)^c = \{7, 11\}$; $|A \cup B \cup C| = 10$
- c) $A = \{1, 2, 3, 4, 6, 12\}$, $B = \{1, 2, 3, 6, 9, 18\}$, $C = \{1, 2, 4, 5, 10, 20\}$
 $A \cap B \cap C = \{1, 2\}$, $A \cup B \cup C = \{1, 2, 3, 4, 5, 6, 9, 10, 12, 18, 20\}$, $(A \cup B) \cap C = \{1, 2, 4\}$,
 $(A \cap C) \setminus B = \{4\}$, $A \setminus (B \cup C) = \{12\}$, $(A \cup B \cup C)^c = \{7, 8, 11, 13, 14, 15, 16, 17, 19\}$; $|A \cup B \cup C| = 11$
- d) $A = \{2, 3, 5, 7\}$, $B = \{1, 3, 5, 7, 9\}$, $C = \{5, 6, 7, 8, 9\}$
 $A \cap B \cap C = \{5, 7\}$, $A \cup B \cup C = \{1, 2, 3, 5, 6, 7, 8, 9\}$, $(A \cup B) \cap C = \{5, 7, 9\}$,
 $(A \cap C) \setminus B = \emptyset$, $A \setminus (B \cup C) = \{2\}$, $(A \cup B \cup C)^c = \{0, 4\}$; $|A \cup B \cup C| = 8$
- e) $A \cap B \cap C = \{e\}$, $A \cup B \cup C = \{a, b, c, d, e, f, g, h, i\}$, $(A \cup B) \cap C = \{a, e, g\}$,
 $(A \cap C) \setminus B = \{a\}$, $A \setminus (B \cup C) = \{b, c\}$, $(A \cup B \cup C)^c = \{j\}$; $|A \cup B \cup C| = 9$



Vennov diagram za primer a)

Analiza Naloge 3: – Moč unije dveh množic

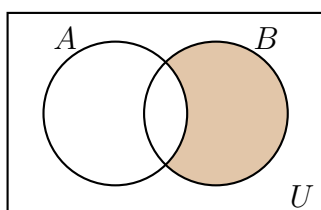
- a) $|N \cup K| = 17 + 13 - 7 = 23$ trenira vsaj en šport; nobenega: $28 - 23 = 5$
- b) $30 = 18 + 15 - |A \cap N| \Rightarrow |A \cap N| = 3$; samo nemščina: $15 - 3 = 12$
- c) $17 = 12 + 9 - |A \cap B| \Rightarrow |A \cap B| = 4$; $|A \setminus B| = 12 - 4 = 8$, $|B \setminus A| = 9 - 4 = 5$
- d) $|K \cup \check{C}| = 50 - 10 = 40$; $40 = 32 + 24 - |K \cap \check{C}| \Rightarrow |K \cap \check{C}| = 16$; samo kava: $32 - 16 = 16$, samo čaj: $24 - 16 = 8$
- e) $|A \cup B| = 40 - 8 = 32$; $32 = 22 + |B| - 6 \Rightarrow |B| = 16$; $|B \setminus A| = 16 - 6 = 10$

Analiza Naloge 4: – Moč unije treh množic

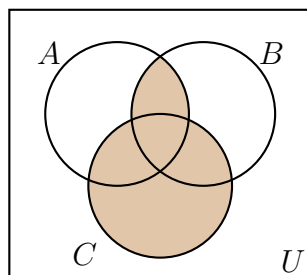
- a) $|A \cup B \cup C| = 10 + 12 + 8 - 4 - 3 - 5 + 2 = 20$
- b) $|M \cup F \cup K| = 14 + 12 + 10 - 5 - 4 - 3 + 2 = 26$; nobenega krožka: $30 - 26 = 4$; samo matematika: $14 - 5 - 4 + 2 = 7$
- c) $|N \cup S \cup Y| = 52 + 40 + 30 - 18 - 12 - 10 + 5 = 87$; nobene: $100 - 87 = 13$
samo N: $52 - 18 - 12 + 5 = 27$, samo S: $40 - 18 - 10 + 5 = 17$, samo Y: $30 - 12 - 10 + 5 = 13$; natanko eno: $27 + 17 + 13 = 57$
- d) $|D_2| = 50$, $|D_3| = 33$, $|D_5| = 20$, $|D_2 \cap D_3| = |D_6| = 16$, $|D_2 \cap D_5| = |D_{10}| = 10$, $|D_3 \cap D_5| = |D_{15}| = 6$, $|D_{30}| = 3$
 $|D_2 \cup D_3 \cup D_5| = 50 + 33 + 20 - 16 - 10 - 6 + 3 = 74$; nobeno: $100 - 74 = 26$
- e) $40 = 20 + 18 + 15 - 7 - 6 - 5 + |A \cap B \cap C| = 35 + |A \cap B \cap C| \Rightarrow |A \cap B \cap C| = 5$
samo v A: $20 - 7 - 6 + 5 = 12$

Analiza Naloge 5: – Senčenje v Vennovem diagramu

a) $A^c \cap B$



b) $(A \cap B) \cup C$



c) $(A \cup B) \setminus C$

