

1. Zapiši izjavno formulo v preneksni normalni obliki.

(a) $\forall x P(x) \Rightarrow \forall x Q(x)$

(b) $\forall x \forall y (P(x, y) \Rightarrow \exists z (P(x, z) \wedge P(y, z)))$

(c) $\forall x (\exists y P(x, y) \Rightarrow \forall y R(y, x) \vee \exists x T(x))$

(d) $\neg \forall x (P(x) \vee \exists z Q(x, z)) \vee \exists z (P(z) \Rightarrow \forall x Q(x, z))$

(e) $\forall t \neg \forall x (P(x) \vee \exists z Q(x, z)) \vee \exists z (\forall x Q(x, z) \Rightarrow P(z))$

2. Kateri od parov spodnjih izjavnih formul so enakovredni? Odgovor utemelji.

(a) $\forall x (\exists y P(x, y) \wedge \exists y R(x, y))$ in $\forall x \exists y \exists z (P(x, y) \wedge R(x, z))$,

(b) $\neg \forall x \exists y (P(x) \wedge R(x, y))$ in $\forall y \exists x (\neg P(x) \vee \neg R(x, y))$.

3. Dane so množice $A = \{1, 2, 3\}$, $B = \{2, 3, 4\}$ in $C = \{0, 1, 4, 5\}$. Določi spodnje množice (naštej njihove elemente).

(a) $(B \setminus A) \cap C$,

(b) $C + (A \cup C)$,

(c) $C + (A \cup B)$,

(d) $A \cup (B \cap C)$,

(e) $\mathcal{P}(A \cap B) \setminus C$,

(f) $\mathcal{P}(A \cap C) + \mathcal{P}(B \cap C)$,

(g) $\mathcal{P}(A \cap C) + \mathcal{P}(A)$.

4. Določi množice:

(a) $\emptyset \cap \{\emptyset\}$,

(b) $\{\emptyset\} \cap \{\emptyset\}$,

(c) $\{\emptyset, \{\emptyset\}\} \setminus \{\emptyset\}$.

5. Ali veljajo naslednje enakosti oz. vsebovanosti z množicami? Dokaži ali pa poišči protiprimer.

(a) $((A \cap B) \cup (C \cap D))^c = (A^c \cup B^c) \cap (C^c \cup D^c)$,

(b) $((A \cup B) \cap (A \cup B^c)) \cup ((A^c \cup B) \cap (A^c \cup B^c)) = \mathcal{S}$,

(c) $(A \cup B) \cap (A \cup B^c) \cap (A^c \cup B) \cap (A^c \cup B^c) = \emptyset$,

(d) $A \setminus (A \setminus (B \setminus (B \setminus C))) = A \cap B \cap C$,

- (e) $A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$,
- (f) $A \cup (B + C) = (A \cup B) + (A \cup C)$,
- (g) $(A \cap B) \setminus C \subseteq (A \cup C) \cap B$,
- (h) $(A + B) \setminus A = B \setminus A$,
- (i) $(A + B) + (A + C) = A + (B + C)$,
- (j) $A + B \subseteq A + (B + C)$.