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) $A + B \subseteq A + (B + C)$.