

1. Poišči interpretacije, v katerih imajo naslednje formule nasprotno logično vrednost.

(a)  $\forall x(P(x) \Rightarrow R(x)), \exists x(P(x) \Rightarrow R(x))$

(b)  $\forall x(P(x) \Leftrightarrow R(x)), \forall x(P(x) \Rightarrow R(x))$

(c)  $\forall x\forall y(P(x) \Rightarrow P(y)), 0$

(d)  $\forall x\forall y(P(x) \Rightarrow P(y)), 1$

2. Ali so katere izmed formul med sabo enakovredne?

$$\neg\forall x\exists y(P(x) \Rightarrow Q(y)), \quad \exists x\forall y(P(x) \wedge \neg Q(y)), \quad \exists x\forall y(\neg P(x) \Rightarrow \neg Q(y))$$

3. Ali so katere izmed formul med sabo enakovredne?

$$\exists x(P(x) \Leftrightarrow Q(x)), \quad \forall x(P(x) \vee Q(x)) \Rightarrow \exists x(P(x) \wedge Q(x)), \quad \exists xP(x) \Leftrightarrow \exists xQ(x)$$

4. Dane so množice  $A = \{1, 2, 3\}$ ,  $B = \{2, 3, 4\}$  in  $C = \{0, 1, 4, 5\}$ . Izračunaj

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

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

(c)  $A \cup (B \cap C)$ .

5. Določi naslednje množice:

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

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

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

6. Ali veljajo naslednje enakosti? 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)  $A \cap (B + C) = (A \cap B) + (A \cap C)$ ,

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