

Übungen 1 – Lösungen

Diese Lösungen sind nicht zwingend die einzig richtigen. Bei verschiedenen Aufgaben gibt es mehrere korrekte Lösungen. Bei Unklarheiten fragen Sie bitte nach.

Beschreiben Sie folgende Mengen mit einer Formel

- a) $\{x | x > 3\}$
- b) $\{x | x \leq 5\}$
- c) $\{x \in \mathbb{Q} | x > 1, x < 9\}$
- d) $\{x | \sqrt{x} < 89\}$
- e) $\{x | x^2 > 10\}$
- f) $\{x | x = 2 * n \text{ und } n \in \mathbb{N}\}$ oder $\{x | \frac{x}{2} \in \mathbb{N}\}$
- g) $\{x | x = 3 * n \text{ und } n \in \mathbb{Z}\}$ oder $\{x | \frac{x}{3} \in \mathbb{Z}\}$

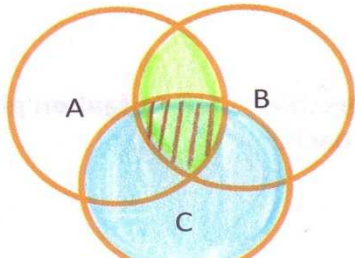
Zu welcher Zahlenmenge gehören folgende Mengen? (Nur die kleinste nennen)

- a) \mathbb{N}
- b) \mathbb{N}
- c) \mathbb{R}
- d) \mathbb{N}
- e) \mathbb{Q}
- f) \mathbb{R}
- g) \mathbb{N}

Zeigen Sie folgenden Aussagen (mit Zeichnungen)

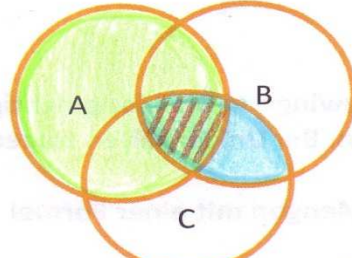
The image shows several Venn diagrams with three overlapping circles labeled A, B, and C. The regions are shaded in different colors and patterns to represent various set operations. Handwritten formulas in blue and red ink are provided for each diagram.

- Top right diagram: $(A \setminus (A \cap B)) \cup (C \setminus A) \cup (A \setminus (A \cap C))$
- a) $(A \cap B) \cup C$
- b) $(A \cup B) \cap C$
- Bottom right diagram: $(A \cap C) \cup (B \cap C)$
- c) $(A \cup B) \cup C$
- Bottom right diagram: $A \cup (B \cap C)$

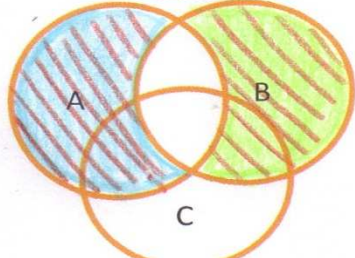


d)

$(A \cap B) \cap C$

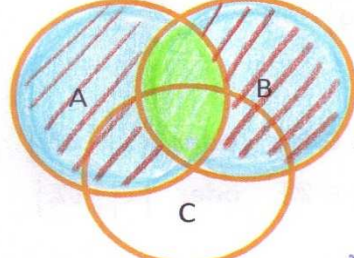


$A \cap (B \cap C)$

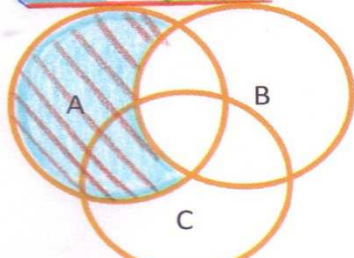


e)

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

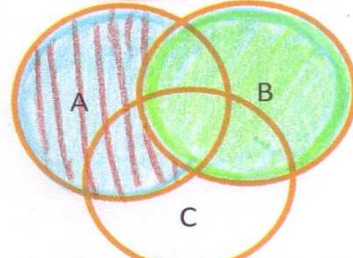


$(A \cup B) \setminus (A \cap B)$

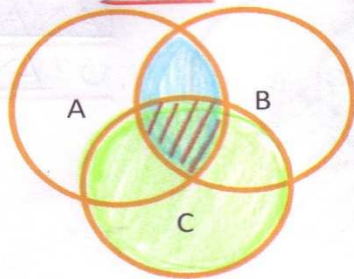


f)

$A \setminus B$

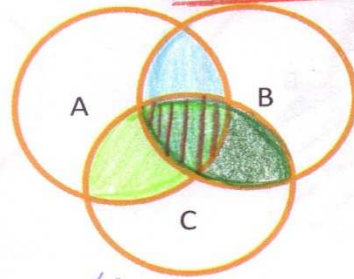


$(A \cup B) \setminus B$



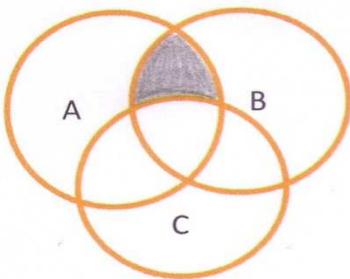
g)

$(A \cap B) \cap C$

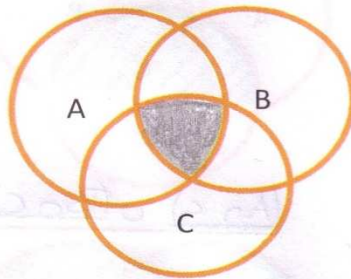


$(A \cap B) \cap (A \cap C) \cap (B \cap C)$

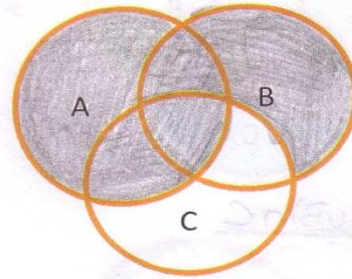
Schraffieren Sie die angegebenen Mengen



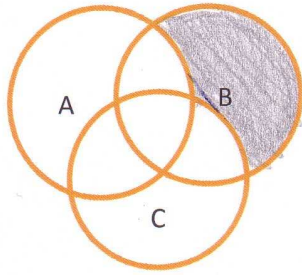
$(A \cap B) \setminus C$



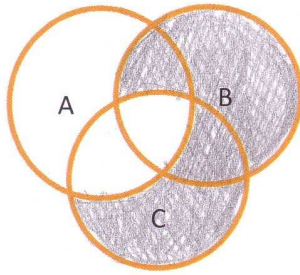
$A \cap (B \cap C)$



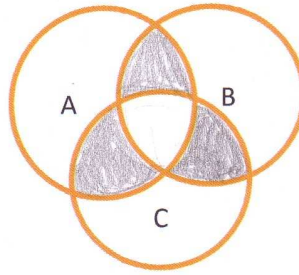
$A \cup (B \setminus C)$



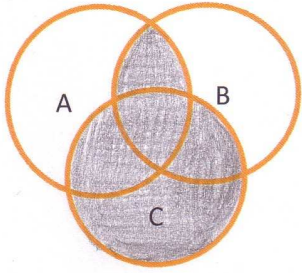
$$(B \setminus C) \setminus A$$



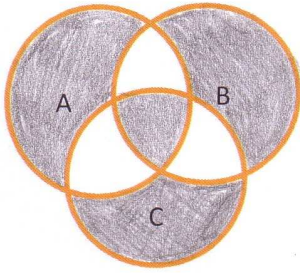
$$(B \setminus C) \cup (C \setminus A)$$



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



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



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

Geben Sie folgende Intervalle in Klammerschreibweise an

- a) (3,4)
- b) [9,11)
- c) [0,8]
- d) (7,12]
- e) (6, ∞)
- f) (-∞, 1)

Sie haben folgende Mengen:

$$A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \quad B = \{2, 4, 6, 8\} \quad C = \{3, 6, 9\}$$

Sind folgende Aussagen richtig oder falsch?

- a) w
- b) f
- c) f
- d) w
- e) w
- f) w
- g) w