

DÚ: 20. 21. 10

1) Určete, které z následujících množin se rovnají:

- $A = \{x \in \mathbb{Z}; x > 0\} = \{1, 2, 3, \dots\}$
- $B = \{x \in \mathbb{R}; -1 \leq x \leq 1\} = \langle -1, 1 \rangle$
- $C = \{-3, -2, -1, 0, 1, 2, 3\}$
- $D = \{x \in \mathbb{R}; |x| \leq 1\} = \langle -1, 1 \rangle$
- $E = \{x \in \mathbb{Z}; -4 < x < 4\} = \{-3, -2, -1, 0, 1, 2, 3\}$
- $\emptyset$
- $F = \{0\}$

$$\frac{D=B}{C=E}$$

2) Určete doplněk množiny B v množině A, jestliže:

a)  $A = \{-3; -1; 0; 1; 2; 3; 4; 5\}$   $B_A^c = \{-1; 0; 4; 5\}$   
 $B = \{-3; 1; 2; 3\}$

b)  $A = \{x \in \mathbb{Z}; x < 5\} = \{\dots, 1, 2, 3, 4\}$   $B_A^c = \mathbb{Z}_0^- \cup \{4\}$   
 $B = \{x \in \mathbb{N}; x \leq 3\} = \{1, 2, 3\}$

c)  $A = \mathbb{Z}$   
 $B = \{x \in \mathbb{Z}; |x| > 1\} = \{\dots, -3, -2, 2, 3, \dots\} = \mathbb{Z} \setminus \{-1, 0, 1\}$   $B_A^c = \{-1, 0, 1\}$

d)  $A = \mathbb{R}$   
 $B = \{x \in \mathbb{R}; \frac{x}{x} = 1\} = \mathbb{R} \setminus \{0\}$   $B_A^c = \{0\}$

e)  $A = \mathbb{N}$   
 $B = \{x \in \mathbb{N}; x > 5\} = \mathbb{N} \setminus \{1, 2, 3, 4, 5\} = \{6, 7, 8, \dots\}$   $B_A^c = \{1, 2, 3, 4, 5\} = \{x \in \mathbb{N}; x \leq 5\}$

3) Určete průnik, sjednocení a rozdíl množin A a B, jestliže platí:

a)  $A = \{x \in \mathbb{Z}; x < 5\} = \{\dots, -1, 0, 1, 2, 3, 4\}$   $A \setminus B = \mathbb{Z}_0^- \cup \{4\} = \{\dots, -1, -2, -1, 0, 4\}$   
 $B = \{x \in \mathbb{N}; x \leq 3\} = \{1, 2, 3\}$   $A \cap B = \{1, 2, 3\} = B$   
 $B \subset A$  tedy  $A \setminus B = B_A^c$  a  $A \cup B = A$   $A \cup B = A$

b)  $A = \mathbb{N} = \{1, 2, 3, 4, \dots\}$   $A \cap B = \{1, 2\}$   
 $B = \{x \in \mathbb{Z}; |x| < 3\} = \{-2, -1, 0, 1, 2\}$   $A \cup B = \{-2, -1, 0, 1, 2, \dots\}$   
 $B \not\subset A$   $A \setminus B = \{3, 4, 5, \dots\} = \{x \in \mathbb{Z}; x > 2\}$   
 $A \cup B = \{x \in \mathbb{Z}; x > -3\}$

c)  $A = \mathbb{N}$

$$B = \{x \in \mathbb{Z}; x < -1\} = \{\dots, -4, -3, -2\}$$

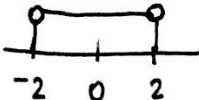
$$A = \mathbb{N} = \{1, 2, 3, \dots\}$$

$$A \cap B = \emptyset$$

$$A \cup B = \mathbb{Z} \setminus \{-1, 0\}$$

$$A \setminus B = A$$

d)  $A = \mathbb{Z}$

$$B = \{x \in \mathbb{R}; |x| < 2\} = (-2, 2)$$


$$A \cap B = \{-1, 0, 1\}$$

$$A \cup B = \mathbb{Z} \cup (-2, 2)$$

$$A \setminus B = \{x \in \mathbb{Z}; |x| > 1\}$$

$$A \setminus B = \mathbb{Z} \setminus \{-1, 0, 1\}$$

e)  $A = \{x \in \mathbb{N}; x > 2\} = \{3, 4, 5, 6, \dots\}$

$$A \cap B = \{3, 4, 5, 6\}$$

$$B = \{x \in \mathbb{N}; x < 7\} = \{1, 2, 3, 4, 5, 6\}$$

$$A \cup B = \mathbb{N}$$

$$A \setminus B = \{x \in \mathbb{N}; x > 6\}$$

f)  $A = \{x \in \mathbb{Z}; x > -3\} = \{-2, -1, 0, 1, \dots\}$

$$A \subset B$$

$$B = \{x \in \mathbb{Z}; x > -5\} = \{-4, -3, -2, -1, \dots\}$$

$$A \cap B = \{-2, -1, 0, 1, \dots\} = A$$

$$A \cup B = B$$

$$A \setminus B = \emptyset$$

$$A \setminus B = \{-4, -3\}$$

g)  $A = \mathbb{N} = \{1, 2, 3, \dots\}$

$$A \cap B = \emptyset$$

$$B = \mathbb{Z}^- = \{\dots, -3, -2, -1\}$$

$$A \cup B = \mathbb{Z} \setminus \{0\} = \{x \in \mathbb{Z}; |x| \geq 1\}$$

$$A \setminus B = A$$

h)  $A = \{x \in \mathbb{N}; x > 4\} = \{5, 6, 7, \dots\}$

$$A \cap B = \emptyset$$

$$B = \{x \in \mathbb{Z}; x < -6\} = \{\dots, -8, -7\}$$

$$A \cup B = \mathbb{Z} \setminus \{x \in \mathbb{Z}; -7 < x < 5\} = \{x \in \mathbb{Z}; |x| > 5\}$$

$$A \setminus B = A$$

i)  $A = \{x \in \mathbb{Z}; x > -1\} = \{0, 1, 2, 3, \dots\}$

$$A \cap B = A$$

$$B = \{x \in \mathbb{Z}; x > -6\} = \{-5, -4, -3, \dots\}$$

$$A \setminus B = \emptyset$$

$$A \subset B$$

$$A \cup B = B$$