

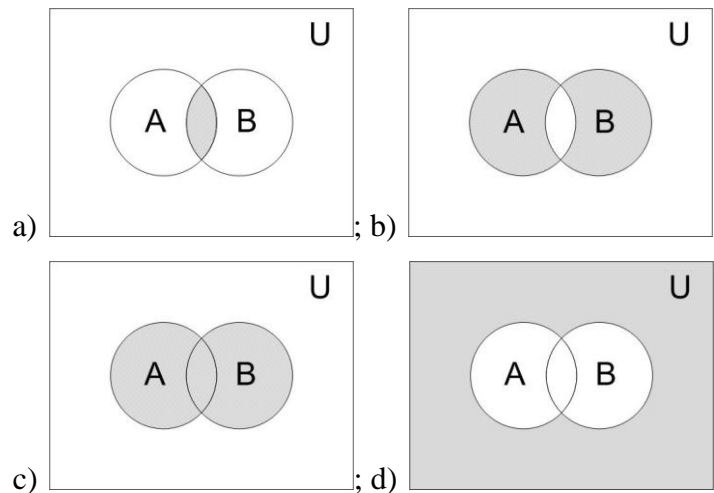
Student: _____

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HOMEWORK 1

1. Indicate the graphic interpretation of disjunctive collection of two sets:



2. Two sets A and B are equal, if:

- number of elements in each set is $(A + B)/2$;
- number of elements in both sets are the same;
- they contain the same elements;
- number of elements in sum makes the universe.

3. Indicate operation that impracticable over sets:

- intersection;
- difference;
- division;
- union;
- symmetric difference of sets;
- absolute complement of A in \mathbf{U} .

4. Which law of operations over sets describes $A \cap (B \cap C) = (A \cap B) \cap C$:

- commutative;
- distributive;
- law of absorption;
- law of De Morgan;
- associative.

5. What are from given relations wrong and why:

- $x \in \{2, a, x\}$;
- $3 \in \{1, \{2, 3\}, 4\}$;

- c) $x \in \{1, \sin(x)\}$;
- d) $\{x, y\} \in \{a, \{x, b\}\}$?

6. Which from listed below methods is the method of describing a set by *generating pair*:

- a) $A = \{1, 2, 3, 4, \dots\}$;
- b) $A = \{3, 5, 7, 11, \dots\}$;
- c) $A = \{1, 2, 4, 8, 16, \dots\}$;
- d) $A = \{2, 32, 8, 16, \dots\}$.

7. What designate a symbol “ \cup ” in basic operations over sets:

- a) disjunctive collection;
- b) intersection of sets;
- c) absolute complement;
- d) union of sets (sum of sets).

Problem 1

Let the set of first twenty natural numbers in the capacity of universal set and write down the next subsets: A – the set of even numbers; B – the set of odd numbers; C – the set of squares; D – the set of prime odd numbers. In what relations those subsets are?

Solution: $\mathbf{U} = \{1, 2, 3, 4, \dots, 20\}$

Problem 2

Write sets obtained in the issue following operations over sets from **Problem 1**: $A \cup B$, $A \cap B$, $A \cap C$, $A \cap D$, $C \setminus A$, $C \setminus B$, $C + D^c$. Formulate specific properties for every derived set.

Solution: