

Worksheet: Sets

ISC · Class 11 · Mathematics · 9 questions · 25 marks

Name: _____

Date: _____

Score: _____ / 25

Q1. Write the set $A = \{x : x \text{ is an integer, } x^2 = 9\}$ in roster form, and $B = \{5, 10, 15, 20, 25\}$ in set-builder form. [2 marks]

Q2. Classify each as empty, finite, or infinite: (i) $\{x : x \text{ is a natural number and } x+3=2\}$, (ii) the set of lines through a fixed point in a plane, (iii) $\{x : x \text{ is an even prime number}\}$. [2 marks]

Q3. Write $\{x : x \text{ is a real number, } -2 \leq x < 5\}$ as an interval, and write the interval $(0, 10]$ in set-builder form. [2 marks]

Q4. How many subsets and how many proper subsets does a set with 5 elements have? List one subset containing exactly 2 elements as an example. [3 marks]

Q5. If $A = \{1, 2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7\}$, find $A \cup B$, $A \cap B$, and state whether A and B are disjoint. [3 marks]

Q6. If $A = \{2, 4, 6, 8, 10\}$ and $B = \{4, 8, 12\}$, find $A - B$ and $B - A$, and explain why they are different sets. [3 marks]

Q7. If $U = \{1, 2, \dots, 10\}$, $A = \{1, 2, 3, 4, 5\}$, $B = \{4, 5, 6, 7\}$, find A' and B' , and hence find $A' \cup B'$. [3 marks]

Q8. If $U = \{1, 2, \dots, 9\}$, $A = \{1, 3, 5, 7\}$, $B = \{2, 3, 5, 8\}$, verify De Morgan's second law: $(A \cap B)' = A' \cup B'$. [4 marks]

Q9. Let $A = \{2, \{3\}, 4, \{5, 6\}\}$. State, with reasons, whether each is true: (i) $3 \in A$, (ii) $\{3\} \in A$, (iii) $\{3\}$ subset A , (iv) $\{5, 6\}$ subset A . [3 marks]