Class 11 Mathematics · Chapter 1: Sets

Worksheet · 20 marks · about 40 minutes · based on NCERT

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1. Which of the following is a singleton set? [1]

(a) $\{x : x \in R \text{ and } x^3 = 27\}$
(b) $\{x : x \in Z \text{ and } x^2 = 9\}$
(c) $\{x : x \in N \text{ and } x + 3 = 2\}$
(d) $\{x : x \in N \text{ and } x \text{ divides } 9\}$

2. The set $\{x : x \in Z \text{ and } -2 < 2x \le 5\}$ in roster form is [1]

(a) $\{-1, 0, 1, 2\}$
(b) $\{0, 1, 2, 3\}$
(c) $\{0, 1, 2\}$
(d) $\{1, 2\}$

3. Which of the following sets is infinite? [1]

(a) The set of divisors of 1000000
(b) The set of points on a line segment 1 cm long
(c) The set of districts of India
(d) $\{x : x \in N \text{ and } x < 1000000000\}$

4. The set $\{3, 8, 15, 24, 35\}$ in set-builder form is [1]

(a) $\{x : x = n^2 - 1, n \in N \text{ and } 1 \le n \le 5\}$
(b) $\{x : x = 2n + 1, n \in N \text{ and } 1 \le n \le 5\}$
(c) $\{x : x = n^2 - 1, n \in N \text{ and } 2 \le n \le 6\}$
(d) $\{x : x = n^2 + 2, n \in N \text{ and } 1 \le n \le 5\}$

5. The number of subsets of the set of prime numbers less than 20 is [1]

(a) 256
(b) 255
(c) 128
(d) 64

6. A set A has 2 more elements than a set B, and A has 48 more subsets than B. Find n(A) and n(B). [2]

7. Write $A = \{x : x \in R \text{ and } -3 < x \le 5\}$ and $B = \{x : x \in R \text{ and } 1 \le x < 8\}$ as intervals, and write $A \cap B$ as an interval. [2]

8. Write in roster form: (i) $\{x : x \in Z \text{ and } x^3 = 4x\}$, (ii) $\{x : x \in N \text{ and } x^3 = 4x\}$. [2]

9. For subsets A and B of a universal set U, prove that $A - B = A \cap B'$. [3]

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10. A and B are finite sets with $n(A) = 12$, $n(A \cap B) = 5$ and $n(B - A) = 9$. Using the fact that $A - B$, $A \cap B$ and $B - A$ are mutually disjoint, find $n(A - B)$, $n(B)$ and $n(A \cup B)$. [3]

11. Using the laws of the algebra of sets, show that $A \cap (A' \cup B) = A \cap B$, stating the law used at each step. [3]