

1. (10 points) List the members of the set $S = \{x | \sqrt{x} \in \mathbb{Z} \text{ and } |x| \leq 20\}$.
2. (10 points) Use set builder notation to compute $\mathbb{Z}^+ - \{x | x \in \mathbb{Z} \text{ and } x \text{ is even}\}$.
3. (10 points) Find $P(A)$ for $A = \{1, a, *\}$.
4. (10 points) Find $|P(A)|$ for $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$.
5. (10 points) For $U = \{1, 2, 3, \dots, 9, 10\}$, draw the sets $A = \{1, 5, 7, 8\}$, $B = \{2, 5, 8\}$ and $C = \{3, 6, 9\}$ in a Venn diagram.
6. (10 points each) In a Venn diagram shade

i) $(A \cup B) - C$

ii) $(A \cap B) - B$

7. (8 points each) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 7\}$. Construct by listing the members and find the cardinality of each of the following sets.

i) $A \cup B$

ii) $A \cap B$

iii) $A - B$

iv) $B - A$

v) $A \times B$