

MATH 1101

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SETS

- Question 1.**
- Let U be the universal set and A, B , and C be subsets of U defined as follows: $U = \{a, b, c, d, e, f\}$, $A = \{a, c\}$, $B = \{d, e, f\}$ and $C = \{c, d, e\}$. Find:
 - $A \cup (B \cup C)'$
 - $A' \cap (B \cap C)$
 - List the elements of the set $M = \{x | x \text{ is a natural number greater than } 12\}$.
 - Suppose $A = \{0, 2, 4, 6, 8\}$, $B = \{1, 3, 5, 7\}$ and $C = \{2, 8, 4\}$. Find:
 - $A \cup B$
 - $A \cap C$
 - $(B \cap C)'$
 - $(A \cap B)'$
 - $A' \cup B'$
 - List the elements of the set $Z = \{x | x^2 = 9\}$.
 - Let $R = \{1, 2, 3, 4\}$ and $T = \{2, 4, 6\}$. List the elements of:
 - $\{x | x \in R \text{ and } x \in T\}$
 - $\{x | x \in R \text{ or } x \in T\}$
 - $\{x | x \in R \text{ and } x \notin T\}$
- Question 2.**
- Use Venn diagram to verify that $(A \cup B)' = A' \cap B'$.
 - A survey was conducted at MUST where 50 students were randomly chosen and asked whether they like apples or bananas. Of the 50, 30 students said they like apples, 35 students said they like bananas and 20 like both apples and bananas. 5 students do not like either apples or bananas.
 - How many students like both apples and bananas?
 - How many students like bananas only?

- c. There are twenty five dogs at the dog show. 12 of the dogs are black, 8 of the dogs have short tails, and 15 is black with a short tail and long hair. 3 dogs are black with short tails and do not have long hair. 2 dogs have short tails and long hair but are not black. If all of the dogs in the kennel have at least one of the mentioned characteristics, how many dogs are black with long hair but do not have short tail?
- d. In a class of 120 students, 6 play football, volleyball and netball, 16 play football and volleyball, 17 play volleyball and netball, 53 play football, 47 play volleyball and 44 play netball. How many play none of the sporting games?