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Set Description

Objectives:

After reading and completing this module, you will be able to do these:

- ✓ Determine the cardinality of a given set.
- ✓ Determine if a set is null set.
- ✓ Distinguish a finite from an infinite set.



LESSON PROPER

CARDINAL NUMBER

- The cardinal number or cardinality of a Set A, denoted by $n(A)$, indicates the number of elements in the set A.

Example:

1. The set $A = \{a, b, c\}$ has 3 elements, thus its cardinality is 3, and we write $n(A) = 3$.
2. If $N = \{n \mid n \text{ is a day of the week}\}$, the cardinality is 7, and we write $n(N) = 7$.
3. S is the set of 9-year old students in Xavier High School; $n(S) = 0$.

EMPTY SET

- The empty set (or null set) is a set that has no elements (or members).
- Notation: The symbol \emptyset or $\{ \}$ is used to represent the empty set.

Example:

1. The set of female students in Xavier School, San Juan. (*There are no female students studying in Xavier School, San Juan. Therefore, the set has no elements.*)
2. $D = \{d \mid d \text{ is natural number less than } 1\}$ (*Natural numbers are numbers starting from 1, 2, 3, ...*)

Xavier School SETS

FINITE SET

- Finite sets are sets that have a finite number of members. If the elements of a finite set are listed one after another, the process will eventually “run out” of elements to list.
- A set is also finite if the cardinal number of A is a natural number or 0.

Example:

A is the set of letters in the English alphabet.

$$A = \{a, b, c, \dots, z\}$$

Since there is a last element z, therefore, Set A is a Finite Set or,

Since $n(A) = 26$ (the cardinality of set A is a natural number), therefore, set A is a finite set.

INFINITE SET

- A set A is infinite if it is not finite.
- It is not possible to explicitly list out all the elements of an infinite set.

Example:

A is the set of numbers which are multiples of 3.

$$A = \{3, 6, 9, \dots\}$$

Since there is no last element, therefore, set A is an infinite set or,

$n(A) = n^\#$, therefore, set A is an infinite set.



TRY THIS!

Classify the following as **finite** or **infinite**.

1. A is the set of letters in the English alphabet.
2. B is the set of numbers that are multiples of 3.
3. C is the set of animals inside Aviron Zoo.
4. D is the set of all even numbers.
5. E is the set of all perfect squares between 1 and 3000.