SETS: AN INTRODUCTION

(Set, Subset, Cardinality of Set, 3 Ways of Describing a Set, Equal and Equivalent Sets, Types of Set)

Name: _



In this lesson, you are expected to:

- Define and illustrate well-defined sets, subsets, universal sets, null set, cardinality of sets.
- Enumerate the three ways of describing a set •
- Appreciate the importance of sets in our life



A. SET

1. Set- a group or collection of objects. Each object in a set is called a member or an element of a set. The groups are called sets for as long as the objects in the group share a characteristic and are thus, well defined or welldistinguished.

2. Cardinality of a set A is the *number of elements* contained in A.

Example.1.1 Sort the following objects into the following sets: fruits(A), flowers(B)

Rose, banana, gumamela, apple, jasmine, orchid, grape, mango

Solution: $A = \{banana, apple, grape, mango\}$ $\mathbf{B} = \{ \text{rose, gumamela, jasmine, orchid} \}$

D (1050; Sumanola, Jusinine, oreina)						
Set	<i>Element</i> (\in) read	Cardinality				
A = { banana,apple, grape, mango, }	Banana ∈ A	read as Banana is an element of A	n(A) = 4			
	Apple \in A	read as apple is a member of A				
	Grape $\in A$	read as grape a member of A				
	mango∈ A	read as mango is an element of A				
If an element, say <i>rose</i> does not belong to set A, then we write $rose \notin A$, where the \notin is the sign which means <i>"is not</i>						
an element of" or "is not a member of"						

Example 1.2

- $X = \{a, e, i, o, u\}$
- 1. What are the elements of set X? the elements are a, e, i, o, u. OR $a \in x$, $e \in x$, $i \in x$,
- 2. What is the cardinality of set X? why? n(X) = 5, because the number of l n ent
- 3. Is *b* an element of X? <u>NO</u>, $b \notin X$

3 WAYS OF DESCRIBING A SET

3. Is b an element of X? $\underline{NO, b \notin X}$ AYS OF DESCRIBING A SET					
	Examples	DESCRIPTIO	ROSTER METHOD of TABOLAR FORM	RULE METHOD or SET-BUILDER NOTATION	
	Let X be the set of all days of the week	{all days in week}	X = {Mon,Tue, Wed, Thu, Fri, Sat, Sun}	$X = \{x x \text{ is the day of the week}\}$	
	The set of months of a year whose names begin with a consonant	{ months of a year whose names begin with a consonant }	A = {January, Febuary, March, May, June, July, September, November, December}	A = {x x is the month of a year whose names begin with a consonant}	
	The set of whole numbers from 2 to 8	{whole numbers from 2 to 8}	W= {2, 3, 4, 5, 6, 7, 8}	$W = \{x x \text{ are whole} $ numbers from 2 to 8}	

SUBSET (\subseteq)-is a set whose elements are elements of another set.

 \subseteq = read as " is a subset of"

 $\not\subseteq$ = read as " is not a subset of"

SET	Subset (⊆)?	Explanation	
Y = {0,1,2,3,4,5,6,7,8,9,10}	X= {0,2,4,6,8}	$X \subseteq Y$ because every element of X is an element of Y.	
	Z= {1,2,3,4,5}	$\mathbf{Z} \subseteq \mathbf{Y}$ because every element of X is an element of Y.	
	Q= {3,6,9,12}	$\mathbf{Q} \not\subseteq \mathbf{Y}$ because $12 \notin \mathbf{Y}$	