SETS VOCABULARY

Set – collection of objects. Use Capital letters to represent the set name.

Element – a member of a set. Use lowercase letters to represent the elements of the set.

The ***cardinal number*** of set A is the number of elements in set A. It is denoted $n(A)$ and read "The number of elements in the set A". A set is **finite** if its cardinal number is a whole number. An **infinite** set is one that is not finite.

Example: $A = \{2, 4, 6, 8\}$
2 is an element of A or $2 \in A$
3 is not an element of A or $3 \notin A$
The cardinality of set A is 4 or $n(A) = 4$.
Set A is a finite set

Representing a Set with the Listing Method
Write the set by listing its elements inside braces.
Example: $A = \{2, 4, 6, 8, \ldots\}$

Representing a Set with the Set-builder Notation
Is there a characteristic that all the elements in the set share that can be used to describe the set in words or by a formula?
Example: $A = \{2, 4, 6, 8, \ldots\} = \{x \mid x \text{ is an even integer}\}$ We read this as "The set A is equal to x such that x is and even integer."

Familiar Sets of Numbers
The set of Natural (counting) Numbers $N = \{1, 2, 3, \ldots\}$
The set of Whole Numbers $W = \{0, 1, 2, 3, \ldots\}$
The set of Integers $I = \{\ldots, -2, -1, 0, 1, 2, \ldots\}$
The set of Rational Numbers (fractions) $Q = \{x : x$ *can be written in the form* a / b *,where a* and *b* are integers and *b is not zero*$\}$
The set of Real Numbers $R = \{x : x$ *has a decimal expansion*$\}$

A set is ***well-defined*** if we are able to tell whether any particular object is an element of that set or not.
Example: $A = \{2, 4, 6, 8, \ldots\}$ is well-defined because we know what numbers belong to A and what numbers do not belong to A
$B = \{\text{tall men}\}$ is not well-defined because the definition of "tall" is not specific

The set that contains no elements is called the ***empty set or null set*****.** This set is labeled by the symbol $\varnothing$. Another notation for the empty set is $\{\ \}$.

The ***universal set*** is the set of all elements under consideration in the problem and is denoted by the capital letter U.