2.1 Notes Worksheet   Name: _____

Sets and Operations

<u>Set</u>: _____

<u>Elements</u>:_____

<u>Set Notation</u>:

$B = \{2,\ 4,\ 8,\ 16,\ 32\}$

<u>Empty Set</u>: The set containing no elements, denoted _____ or _____.

<u>Universal Set</u>: The set of all possible things (in context), denoted U.

<u>Intersection of Sets</u>: Denoted $A \cap B$, this new set consists of elements that are in *both* A and B simultaneously.

       Example:

<u>Mutually Exclusive</u>: Two sets are mutually exclusive if they have *no* elements in common.

       Example:

<u>Union of Sets</u>: Denoted $A \cup B$, this new set consists of elements that are in A or B (inclusive "or").

       Example:

1. Define the sets below if $A = \{d, a, i, s, y\}$, $B = \{s, a, y\}$, $C = \{b, e, t\}$, $D = \{y, a, s\}$, and
   $U = \{a, b, c, \ldots, z\}$.

   a) $A \cap B =$ d) $C \cap B =$

   b) $B \cup D =$ e) $U \cap D =$

   c) $A \cup B =$ f) $B \cup C =$

2. Consider sets X and Y, where $n(Y) = 4$, $n(X) = 5$, and $n(X \cup Y) = 7$.
   a) Draw a Venn Diagram that illustrates this relationship, using the universal set
      $U = \{a, b, c, \ldots, z\}$.

   b) $n(X \cap Y) =$

Cardinal Number Rule for Union/Intersection of Sets:

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<u>Complement of a Set</u>: denoted by A'; this represents every element in the universal set that is *outside* of A.

    Example:

<u>Relationship between set theory and logic:</u>

Set Theory		Logic		Common Wording
Term	**Symbol**	**Term**	**Symbol**	
				or
				and
				not
				If _____,then _____