Your solutions to the questions on this worksheet are due AT THE BEGINNING of class on Tuesday, February 3.

1. Explain why the intersection of two sets is always a subset of the union of these same two sets:

2. Explain (in words) how sets $A$ and $B$ can be mutually exclusive while also sets $B$ and $C$ can be mutually exclusive, but collectively $A$, $B$, and $C$ NOT be pairwise mutually exclusive. After your explanation, draw a Venn Diagram of this situation.

3. Why does the complement of a set have to be defined in "reference to" another set?

4. Look at your Venn diagram in the notes which corresponds to the set $(A \cup B)'$. Are any of these points in set $A$? Are any of these points in set $B$? Using these two questions as motivation, can you use symbols to express $(A \cup B)'$ in a different way?

5. Look at your Venn diagram in the notes which corresponds to the set $(A \cap B)'$. Are any of these points not in the set $A$? Are any of these points not in the set $B$? Using these two questions as motivation, can you use symbols to express $(A \cap B)'$ in a different way?
6. Identify SPECIFICALLY what is wrong with the following definitions:

**Function**- a set of ordered pairs where each first element of the pair is matched to a second element.

**Function**- each first element is paired with a unique second element.

**Function**- a set of ordered pairs where one pair is uniquely matched with a second pair.