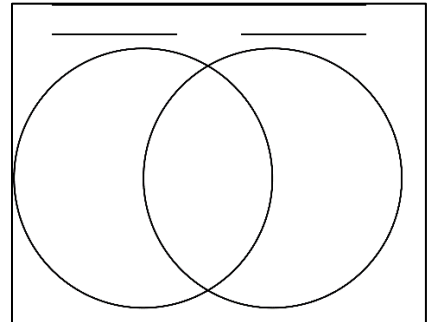
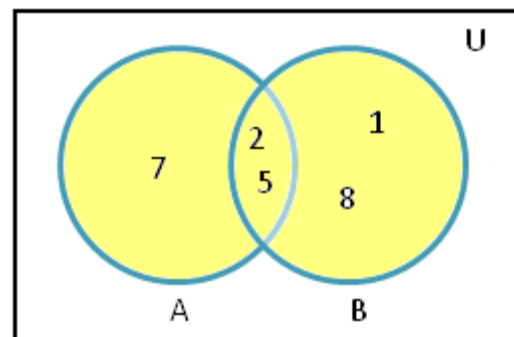


**Instructions:** You must show all work to receive full credit for the problems below. You may use Excel where appropriate. Any datasets needed will be posted on Blackboard with the quiz file, and you should submit such work along with your quiz. Round answers to two decimal places unless other instructions are given in the problem.

1. Consider the sets  $A = \{2, 5, 7, 9, 11, 13\}$  and  $B = \{0, 1, 4, 6, 9, 11, 12\}$ , and let  $U$  the universal set are all integers from 0 to 15 (inclusive). Use this information to find the following and write the answers in the proper set notation:
  - a.  $A \cup B$
  - b.  $A \cap B$
  - c.  $A'$
  - d. Use the Venn diagram below to draw the information. Label the sets  $A$  and  $B$ , and let the outer box be the Universal set. Be sure to account for all the values between 0 and 15, and place any common values in the intersection.



2. Use the image of the Venn diagram below to answer the questions that follow in proper set notation:
  - a. List the elements of  $A$
  - b. List the elements of  $B$
  - c. List the elements of  $A \cap B$



3. Draw a Venn diagram that illustrates the  $A \subset B$ .

4. Rewrite the expression  $\forall x \exists y x + 2y < 9$  in English words. Give an example of an  $x$  and a  $y$  that satisfies the expression.
5. If  $p$  is the statement "The moon is full", and  $q$  is the statement "The snow is falling", translate each of the following logical notations into English sentences.
- $p \wedge q$
  - $p \vee q$
  - $p \rightarrow q$
  - $\sim q$