Venn Diagrams

<u>Set</u> - A collection of elements $A = \{1, 2, 3, 4, 5\}$ $B = \{2, 4, 6, 8, 10\}$

<u>Union</u> (\cup) - The elements in A, B or both A and B

 $\underline{Intersection}~(\frown)$ - The elements in both A and B

Disjoint / Mutually Exclusive - A and B have no elements in common

<u>Universal Set</u> (U) - The elements in A, B, both A and B and neither

<u>Subset</u> (\subset) - Every element in A is also an element of B

Venn Diagrams - Pictures that represent the union or intersection of sets



1. The Venn Diagram below shows the students in the junior class who take physics and chemistry. Set *A* represents the number of students who take physics and Set *B* represents the number of students who take chemistry.



- a) How many students take physics?
- b) How many students take chemistry?
- c) How many students take both classes?

- d) How many students take either class?
- e) How many students take neither class?
- f) How many students are in the junior class?

2. For the Venn Diagram, find

- a) Set A
- b) Set B
- c) Set $A \cap B$
- d) Set $A \cup B$



- 3. For the Venn Diagram, let A represent the number of students who play baseball, B the number of students who play football and C the number of students who play tennis.
 - a) How many students play football?
 - b) How many students play tennis?
 - c) How many students play baseball?
 - d) How many students play both football and baseball?
 - e) How many students play only football and baseball?
 - f) How many students play all three sports?



4. Use a Venn Diagram to illustrate each of the following:

a) $(A \cap B)'$

b) $(A \cup B)'$

e) $(A' \cap B')'$

f) $A \cap (B \cap C)$

g) $A \cup (B \cap C)$

h) $(A \cup B) \cap (A \cup C)$

i) $(A \cap B) \cup (A \cap C)$