## Venn Diagrams

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

Union $(\cup)$ - The elements in A, B or both A and B

Intersection $(\cap)$ - The elements in both A and B

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

Universal Set $(U)$ - The elements in $\mathrm{A}, \mathrm{B}$, both A and B and neither

Subset $(\subset)$ - 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?
d) How many students take either class?
b) How many students take chemistry?
c) How many students take both classes?
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) $(A \cap B)^{\prime}$
b) $(A \cup B)^{\prime}$
c) $A^{\prime} \cap B^{\prime}$
d) $A^{\prime} \cup B^{\prime}$
e) $\left(A^{\prime} \cap B^{\prime}\right)^{\prime}$
f) $A \cap(B \cap C)$
g) $A \cup(B \cap C)$
h) $(A \cup B) \cap(A \cup C)$
i) $(A \cap B) \cup(A \cap C)$
