1. $P \vee Q$ is known as a disjunction.
2. $P \wedge Q$ is known as a conjuction.
3. Formulas that are always true are known as tautologies.
4. Formulas that are always false are known as contradictions.
5. Equivalent is the same as saying IFF.
6. Try to show something is a negative statement with logic.
7. An argument is valid if the premisis can not be true with out the conclusion being true.
8. Think of a bound variable as a parameter, and a free variable as an argument.
9. $\{x| \ldots\}$ binds the variable x.
10. $\{x|P(x)\}$ is just the name of a set.
11. Keep in mind, $2 \in \{2\}$ but $2 \neq \{2\}$.
12. Truth set is the set of all values that makes a statement true.
13. Set of all possible values of a variable is known as the universe of discourse for the statement.
14. We say variables range over this universe.
15. In general, $y \in \{x \in A|P(x)\}$ means the same thing as $y \in A \wedge P(y)$.
16. Tautology means true no matter what.
17. Elementhoodtest.
18. Null or empty set is represented by $\varnothing$.
19. The truth set of a statement P(x) is the set of all values of x that make the statement P(x) true.
20. A \B is the same as A - B.
21. The symmetric differemce: $A \Delta B = (A \setminus B) \cup (B \setminus A) = (A \cup B) \setminus (A \cap B)$.
22. Two sets are disjoint if they have no elements in common.
23. To say $A \wedge B$ is meaningless.
24. Theorem: for any sets A and B, $(A \cup B) \setminus B \subseteq A$.
25. The main logical equicalences in logic are:
    (a) DeMorgan's laws.

(b) Commutative laws.

(c) Associative laws.

(d) Idempotent laws.

(e) Distributive laws.

(f) Absorption laws.

(g) Double negation law.

26. $y \in \{x|P(x)\}$is the same as $P(y)$.

27. $\{x \in \mathbb{R}|P(x)\}$ means the universe of discourse can only be the real numbers.

28. Truth set of $P(x) = \{x|P(x)\}$, where P(x) is the elementhood test.

29. The above is for one free variable only.

30. Injective: A one to one function.

31. Surjective(onto): A funtion whose image is equal to its codomain.

32. Bijective: A function that is both injective and surjective.

33. $y \notin \{x|P(x)\}$ means the same as $\neg P(y)$.

34. Keep in mind $\{x|P(x)\}$ is just the name of a set.

35. Logical connectives can only be used to combine statements.

36. Set theory operations to combine sets only.

37. A is said to be a subset of B if every element in A is in B too, $A \subseteq B$

0.1 The Conditional and Biconditional Connectives

1. If P then Q is denoted by $P \implies Q$, this known as a conditional statement, where P is the antecedent and Q is the consequent.

2. $P \implies Q$ and $\neg P \vee Q$ and $\neg(P \wedge Q)$ are all the same.

3. $P \Leftrightarrow Q$ means the biconditional.

1 Quantificational Logic

1. $\forall x P(x) \to Q(x)$means $(\forall x P(x)) \to Q(x)$,not $\forall x(P(x) \to Q(x))$.