

§1.7 Deductive structure

What is the difference between deductive and inductive logic?

Four Elements of Deductive Structure

- 1 _____ : point, line, and plane
- 2 _____ : the meaning of a term or an idea
- 3 _____ : an unproved assumption
- 4 _____ : a mathematical statement than can be proved

These four elements will be used throughout the semester as we solve problems and write our two-column proofs. There will be MANY definitions, postulates and theorems to learn, so be ready to STUDY!

§1.8 Statements of Logic

Consider the following statement:

1) _____ : A statement written in “if-then” form: $(p \rightarrow q)$

2) _____ : The “if” part of the conditional statement (p)

Example: _____

3) _____ : The “then” part of the statement (q)

Example: _____

4) _____ : The _____ of the conditional statement $(q \rightarrow p)$

Example: _____

The **converse** of _____ are ALWAYS true; however,

the **converse** of THEOREMS and _____ are NOT always true.



5) _____ : The negation of the conditional statement ($\sim p \rightarrow \sim q$)
(The symbol for negation is \sim)

Example: _____

6) _____ : The negation of the converse ($\sim q \rightarrow \sim p$)

Example: _____

The conditional statement and the contrapositive statements are _____

7) _____ : Shows that a conclusion is false.

Example: _____

8) _____ statement: The conditional statement and converse are true

Example: If an angle measures 90° , then it is a right angle. (Conditional Statement)
If an angle is a right angle, then it measures 90° . (Converse)

9) **Chain of Reasoning:** If $p \rightarrow q$ and $q \rightarrow r$, then $p \rightarrow r$.

Example: If you are a teenager, then you are always right. $p \rightarrow q$
If you are always right, then people will listen to you. $q \rightarrow r$

Conclusion: If you are a teenager, then _____

Answer the following questions using the conditional statement below.

“If I study, then I will make an A”

- 1 Write the negation of the hypothesis 1 _____
- 2 Write $\sim q$ 2 _____
- 3 Write the contrapositive 3 _____
- 4 Write $q \rightarrow p$ 4 _____
- 5 What do we call $q \rightarrow p$? 5 _____
- 6 Write the inverse 6 _____
- 7 Is this a biconditional statement? 7 _____
- 8 Write the negative of “I will not study”. 8 _____
- 9 Write the concluding statement for the chain of reasoning.

If we behave, then our teacher will tell Mr. Boland.
If our teacher tells Mr. Boland, then we will get ice cream.

9 _____
- 10 Write the concluding statement for the chain of reasoning.

If Joe goes to the movies, then Sue goes to dinner.
If Sam goes to school, then Rachel goes to Waffle House.
If Sue goes to dinner, then Rick goes bowling.
If Kris goes to the library, then Joe goes to the movies.
If Rachel goes to Waffle House, then Kris goes to the library.

10 _____