

# Thursday, September 18

Objective

SWBAT-

Use Deductive reasoning along with the Laws of Detachment and Syllogism

DO NOW

Re-write the conditional statement in if-then form

A deer is albino if it has white fur and pink eyes

Write the converse, inverse, and contrapositive of the conditional statement

Homework: Complete Logic Puzzle

## 2.3 Deductive Reasoning



A mechanic uses deductive reasoning to determine what is wrong with your car.

## 2.3 Deductive Reasoning



A doctor will use deductive reasoning to diagnose a patient.

## 2.3 Deductive Reasoning



A lawyer uses deductive reasoning to build a case.

## 2.3 Deductive Reasoning



A construction foreman uses deductive reasoning to determine what materials are needed at a work site.

## 2.3 Deductive Reasoning



A detective uses  
deductive reasoning to solve crimes.

## 2.3 Deductive Reasoning

Deductive reasoning: the process of reasoning logically from a given true statement to a conclusion. AKA [logical reasoning](#).

## 2.3 Deductive Reasoning

There are two laws used in logical reasoning:

LAW OF DETACHMENT

LAW OF SYLLOGISM



## 2.3 Deductive Reasoning

### LAW OF DETACHMENT

This law states that in a **true** conditional statement then the conclusion is **true**.



If p is true, then q is true.

Example: If it is raining outside, then I will use my umbrella.

It is raining outside

What can you conclude?

## 2.3 Deductive Reasoning

### LAW OF DETACHMENT

More examples:

If Taylor and Nick make the softball team  
Then they will get new hats.

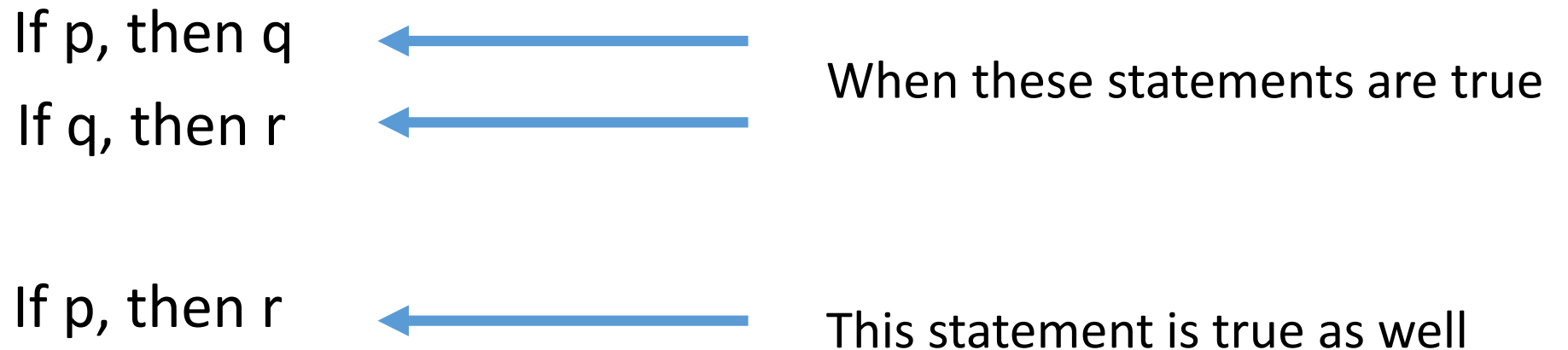
Nick and Taylor made the Softball team.      What can we conclude?

Taylor and Nick get a new hat.

## 2.3 Deductive Reasoning

### LAW OF SYLLOGISM

The conclusion of one true conditional statement is the same as the hypothesis of another true statement.



## 2.3 Deductive Reasoning

### LAW OF SYLLOGISM

If it is Sunday, then Tony goes to the movies.

If Tony goes to the movies, then he will eat popcorn.

Conclusion: If it is Sunday, then Tony will eat popcorn

## 2.3 Deductive Reasoning

When a conditional statement and its converse are both true, they can be written as a single biconditional statement. A biconditional statement is a statement that contains the phrase “if and only if.”

If a triangle is isosceles, then the triangle has two congruent sides.

If a triangle has two congruent sides, then the triangle is isosceles.

A triangle is isosceles if and only if the triangle has two congruent sides.

## 2.3 Deductive Reasoning

If a person lives in Omaha, then, he or she lives in Nebraska.

Tamika lives in Omaha

Can we make a conclusion from this statement? If yes, which law helps us reach it?

Yes, we could use detachment to determine the conclusion

Tamika lives in Nebraska.

## 2.3 Deductive Reasoning