2.3 Deductive Reasoning

If you have noticed that days are longer in the Summer than in the Winter, you have used your powers of *inductive* reasoning.

Or, if you have figured out that you will always lose when betting the good looking and snappy dressing Mr. Kenyorthen you have also used inductive logic.

Recognizing a pattern and making a conjecture is applying inductive reasoning. Finding out *why* something happens involves more work, which brings us to *deductive* logic.

**Deductive Reasoning:** Process of using facts, definitions, and laws of logic to form a logical argument, which can be valid or, actually, invalid as well.

Lawyers use deductive reasoning to show evidence to prove a case.
Laws of Logic

**Law of Detachment:** If the hypothesis \( h \) of a true conditional statement is true, then the conclusion \( c \) is also true.

This is also called a **direct argument**.

If \( h \) then \( c \)

**Example:**
If two angles are right angles, then they are congruent.
\(<C \text{ and } <D \text{ are right angles.} \>
Then \(<C \cong <D \>


Law Of Detachment - Example

John goes to the football game every Friday.
Today is Friday.

First, identify the hypothesis! (Be Careful!)
If today is Friday

Next, identify the conclusion!
Then John goes to the football game

ANSWER!
Laws of Logic

Law of Syllogism:
If the hypothesis (h) then conclusion (q)
If the hypothesis (q), then conclusion (r)
If hypothesis (h), then conclusion (r)

Do you see the chain effect here?

We sometimes call the Law Of Syllogism the "chain rule".

Example:
If Steve wants candy, then Mary will want candy.
If Mary wants candy, then Jesse will want candy.
If Steve wants candy, then Jesse will want candy.
What is the difference between deductive reasoning and inductive reasoning?

**Inductive Reasoning:** Uses examples and looks for patterns to form a conjecture.

**Deductive Reasoning:** Uses facts, definitions, and laws of logic to construct a logical argument.

Which one would you call "street smart?"
Which one would you call "book smart?"
Assignment: P82-85:1-13,16,18,21,22,25-28