## 2.5 If-Then Statements and Deductive Reasoning

An <u>if-then statement</u> has two parts.

The 'if' part contains the <u>hypothesis</u>.

The 'then' part contains the <u>conclusion</u>.

Example 1: Identify the hypothesis and conclusion.

If I sleep through my alarm, then I will miss the school bus.

Hypothesis: I sleep through my alarm

Conclusion: I will miss the school bus

Example 2: Rewrite the statement as an if-then statement.

Every duck on the pond is hungry.

If a duck is on the pond, then it is hungry.

I will go running if it does not snow. If it does not snow, then I will go running. <u>Deductive reasoning</u> uses facts, definitions, accepted properties, and the laws of logic to make a logical arguement.

Law of Detachment: If the hypothesis of a true if-then statement is true, then the conclusion is also true.

Law of Syllogism:

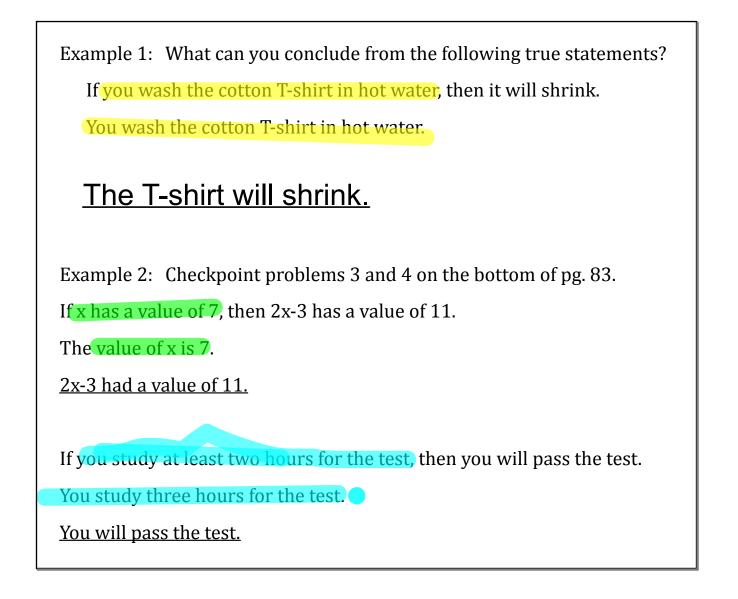
If statement p, then statement q.

If statement q, then statement r.

If statement p, then statement r.

If these statements are true,

then this statement is true.



Example 3: Checkpoint in the middle of pg. 84.

If Naomi saves enough money, then she can buy a concert ticket.

If she buys a concert ticket, then she can see her favorite band.

If Naomi saves enough money, then she can see her favorite band.

If the ball is thrown at the window, <mark>it will hit the window</mark>.

If the ball hits the window, then the window will break.

If the ball is thrown at the window, then the window will break.

Example 4: Write the statement that follows from the pair of true statements.
<b>1</b> If the daily high temperature is 32 degrees F or less, then the water in
the pipe is frozen.
O If the water in the pipe is frozen, then the pipe will break.
If the daily high temperature is 32 degrees F or less, then the pipe will break.
Example 5: Checkpoint on the bottom of pg. 84.

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