Geometry—Chapter 2

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If Then Statements and Postulates

Conditional → Statement formed by joining two statements, sometimes referred to as *p* and *q*, with the words *if* and *then*. $(p \Rightarrow q)$

- hypothesis (*p*) → "If" clause of a conditional statement.
- conclusion (*q*) → "then" clause of a conditional state

Ex: If the sun is coming up, then it must be morning.

It must be morning, if the sun is coming up.

Converse → The statement formed by switching the hypothesis and the conclusion of a given conditional.

Sometimes written as $(q \Rightarrow p)$.

Ex: If it is morning then the sun is coming up.

Counterexample → an example (only ONE) that shows a conjecture or conditional to be false.

Inverse → statement formed by negating both the hypothesis and the conclusion of the Conditional. $(\sim p \Rightarrow \sim q)$

Ex: If the sun is not coming up then it is not morning.

Contrapositive → Statement formed by negating both the hypothesis and the conclusion of the Converse. $(\sim q \Rightarrow \sim p)$

Postulates:

- Through any two points, there is exactly one line.

- Through any three points not on the same line, there is exactly one plane.

What about the other Postulates on pg 79????

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Deductive Reasoning→A system of reasoning used to reach conclusions that must be true whenever the assumptions on which the reasoning is based are true. (general→stmts)

Inductive Reasoning → Process of observing data, recognizing patterns, and then making a generalization or conjecture from the observations. (stmts→general)

Conjecture → an educated guess. In other words, an assumption based on data collected (Hypothesis).

Two Laws:

Law of Detachment→

If $(p \Rightarrow q)$ is a true conditional and p is true, then q is true.

Law of Syllogism→

If $(p \Rightarrow q)$ and $(p \Rightarrow r)$ are true conditionals, then $(p \Rightarrow r)$ is also true. (transitive prop.!!!)

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Using Proof in Algebra

Note:
Properties of Equality for Real Numbers—pg 93

Two Column Proof: see handout

Ex: pg 98 #26

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Proofs with Segment Relationships

Thm: Congruence of segments is reflexive, symmetric, and transitive.

Ex: pg 102 Examples…….